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WHOLE No. 3167

NEW YORK, SATURDAY, NOVEMBER 16, 1918

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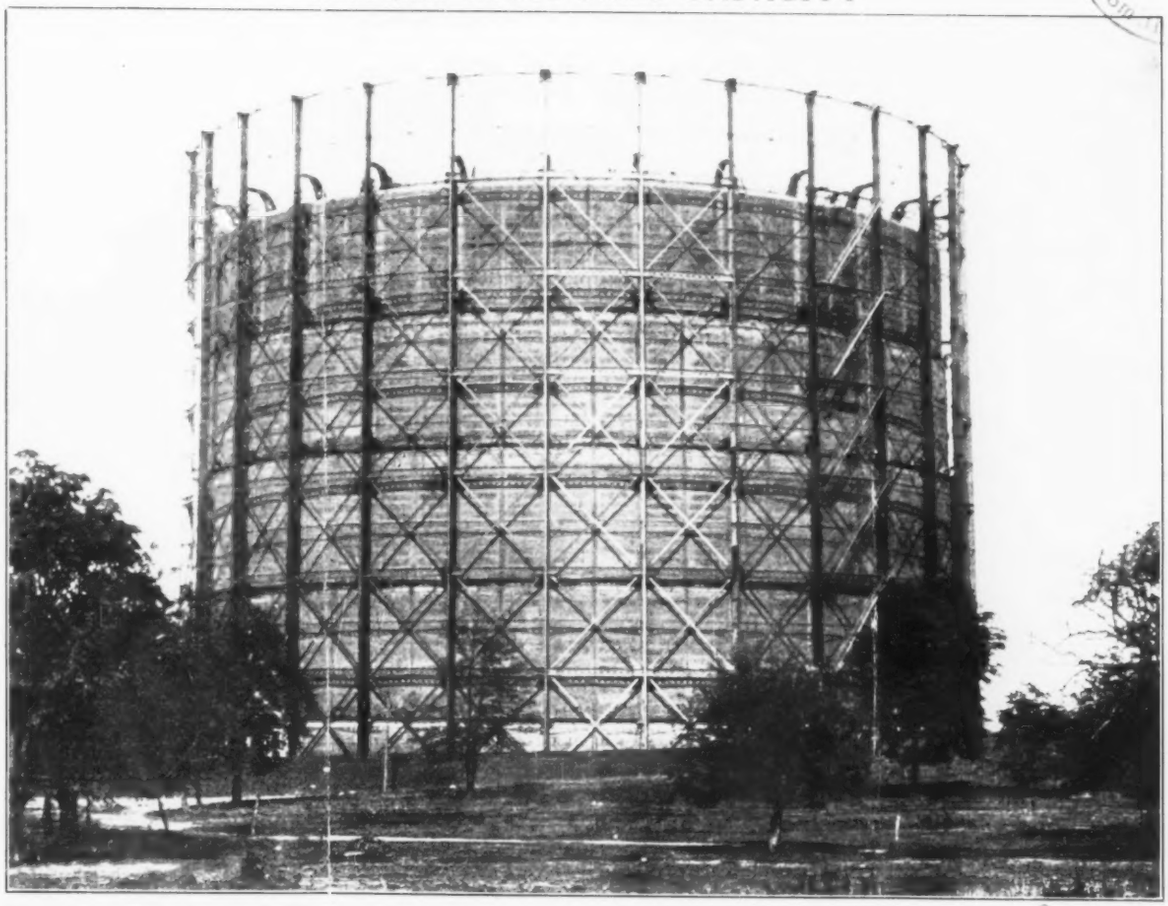

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Readjusting John Jones Back to a Normal Wage

A Matter That Concerns the Welfare of the Whole Nation—Not an Essentially Local Problem and a Matter Entirely of Our Own Business

By EDWIN DEAN

Not long ago we were paying John Jones two dollars a day, and he was glad to take our job. To-day we are paying him five dollars a day and have no assurance of his permanence, the uncertainty being dependent entirely on John's individual will in the matter.

To-morrow, some of us think, John Jones is going to slide back nearer the two dollar scale rather than climb higher than the five dollar plane, our reason for so thinking being the fact that the war is over.

Not a Matter of Our Own Individual Concern

Some of us may get the mistaken notion in our heads that this readjustment of John Jones' wage is a matter of entirely our own business, and the law of supply and demand in the labor market. It is instead a matter of concern to the whole nation.

We are of the white collar class, yet we have a sneaking sympathy for the side of John Jones. Undoubtedly in the past he has, in the majority of cases, gotten the little end of the stick. But these conditions changed when we comprehended that they were uneconomical; that a well-paid employee, co-operating loyally with the company interest, is a mighty cheaply gotten employee as compared to the dissatisfied cuss we got for half that pay merely because it was a case with him of accept it or starve.

If it were possible we would like to see John Jones continue getting five dollars a day, even twenty or a hundred, and have each of those dollars have as high a value to him as the dollar of twenty years ago had. But these things are not possible over a protracted period. There is just so much gold in the world, and if it was suddenly doubled it would represent, ounce by ounce, just half of its present purchasing power. And, besides, we are mutually dependent.

Why John Is Actually No Higher Paid Than He Was Before

If the John Jones we have in mind happens to be a gas company John Jones and we pay him twenty dollars a day instead of two, that means our gas costs so much more to produce. So we must sell it at a higher figure, thus making the living cost of the employee of the shoe manufacturer higher so that the latter has to raise wages. Because of this he has to sell his shoes higher, which makes the farmer's cost of existence higher, hence necessitates an increase in the cost of the food we buy from him and so on. Thus John Jones' high wages are a small boon to him. We give with one hand and take from him indirectly and involuntarily with the other.

The unthinking are too inclined to judge prosperity on the basis of high wages. High wages in general, if we all had them, mean nothing of the kind. The father of the three thousand dollars a year man of to-day was as well, if not better off, twenty years ago at fifteen hundred dollars a year than his son is now. It is even possible that as John Jones' wages go down he may have more to show for his work in the way of purchasing ability and saving power than he now has at his highest peak in point of wages. The danger lies in to what degree he has gotten into extravagant habits.

They tell us the best minds of the country are none too good to cope with this problem of economic readjustment, and that they should set to work immediately. The writer thoroughly agrees with the first clause, but takes one exception to the second. He believes that some very adequate minds have already taken steps towards easing off the drop; that in this war we have seen revealed some uncommon statesmanship.

Try to visualize some of the John Joneses you know. He has had intoxicatingly high wages. But has he seemed in general to exude prosperity?

In some cases, yes. We have seen him plunge on phonographs, clothiers, etc. But in the majority of cases he has seemed nearer "dead broke" than even in bad times. The reason is Liberty Bonds and War Savings Stamps.

John wouldn't have responded very heartily to the appeal in times of plenty, to set something aside for the lean years and for old age.

He never has.

It has been characteristic of the American workman to live for, and in, the present, and let the future take care of itself financially.

But John Jones did respond to the appeal to patriotism, and was curbed in the temptation to extravagance

by, even in his great prosperity, having no money to be extravagant with.

Intelligent Handling Required

The writer is not inclined to be pessimistic in regard to the difficulties of the economic readjustments that are to come. John Jones might be inclined to look solely at figures, and, as his wages go down feel that he is going on the rocks, even though as a matter of fact his purchasing power remains the same. But intelligent handling can well avert this and keep him content. It is therein that the individual employer's attitude becomes a matter of vital concern to the nation.

There may be some who cherish bitterness against their workers, feel that in their hour they got everything the traffic would bear and ruthlessly exploited their opportunity. In this hour, when all of us have been rescued from a thing of such horror as to submerge all else, there is no room for bitterness of any kind—only thanksgiving. We must be patient and sympathetic with John Jones, and painstakingly slow in taking action. No one wants him to be anything other than prosperous and contented. We must convince him that this is honestly our primary thought; that his interests are our interests, since those of both of us are vitally interlinked.

I do not think that John Jones is, for the next decade at least, going back to his pre-war plane of wages. Nor do I think capital is to be deprived of its reasonable and proper rate of return. Some of the easy-money jobs may disappear, undoubtedly will. It is for worker, both mental and physical, and for the capital gotten by work that the future is reserved.

Gas Fuel Used in 18 Different Processes by One Manufacturer

It is common experience that gas introduced in one department of an industrial plant for fuel purposes, is immediately demanded in other parts of the establishment. Its efficiency quickly proves itself. This interesting fact is noticeable in all sections of the territory especially those parts of it around Chicago where many existing manufacturing plants have greatly expanded in size.

In one district particularly where some of the most important manufactories are making use of gas fuel wherever it can be employed, it is significant that practically all of them have been connected up within the past two years. The experience of three of these concerns furnishes a graphic illustration of the rapidity with which gas makes its way.

Originally the managers of each one of the three plants were induced to install gas on a comparatively small scale to be employed as fuel in special work. Its efficiency demonstrated itself almost in a day, whereupon gas was extended to one process after another. In one of the plants referred to gas is the fuel now used in 18 distinct manufacturing operations. Other combustibles employed in the establishment's fabrications will be supplanted by gas on the completion of the line from Blue Island.

In another of the plants, core drying ovens and rivet heaters are run by gas with results in speed—and thus in economy—not attainable by fuels formerly used. In another, gas is running big melting furnaces so large that a lot of it is required. In a fourth plant in the same territory gas fuel is energizing a battery of 30 rivetting machines.

Increases in the amount of gas burned for fuel are noted in other plants in various parts of the territory. In one case where annealing is performed on a huge scale the consumption already large has jumped over 200 per cent.

The company is extending its gas service to a subdivision near Argo, on which the Corn Products Company are building 100 houses for the use of employes of the Corn Products Company. All these residences will be piped for gas. Ultimately, it is understood, 75 more houses will be erected.

The Corn Products Company is one of the large gas customers of the Public Service Company. It uses gas for a multiplicity of purposes in its big plant. Among the most noteworthy of the various employments of the fuel is that of melting solder in immense quantities, an operation performed by the heat of gas in much less time than formerly.—*Public Service Lumen.*

Increased Production of Gasoline from Natural Gas

Statistics just compiled under the supervision of J. D. Northrop, United States Geological Survey, Department of the Interior, show that the natural-gas gasoline industry in the United States made marked progress in 1917.

The quantity of raw gasoline recovered from natural gas in 1917, including that produced by compression, by absorption and by vacuum pumps, as well as that saved as drips from gas mains, was 217,884,104 gal., a gain of 114,391,415 gal., or 111 per cent. over the output of 1916. Of this quantity 168,921,555 gal. or 77.5 per cent. was recovered by compression and by vacuum pumps and the remaining 49,017,549 gal. or 22.5 per cent. by absorption and by salvage from gas mains. The combined product of gasoline obtained by compression and by vacuum pumps was greater than in 1916 by 83,998,768 gal., or 99 per cent., and the product obtained by absorption and from drips was greater by 20,447,647 gal., or 110 per cent.

The quantity of commercial gasoline represented by the output of raw gasoline in 1917, though not susceptible of accurate determination, probably amounted to more than 300,000,000 gal.

The average price received in 1917 for the raw production at the sources of production was 18.45 cents a gallon, and the market value of the entire output was $40,188,956, a gain of 4.6 cents in average unit selling price and of $25,857,808, or 180 per cent. in gross market value as compared with 1916.

The volume of natural gas from which the output of natural-gas gasoline in 1917 was recovered is estimated to have amounted to about 429,000,000,000 cu. ft., and the average recovery of gasoline per thousand cubic feet by all methods was about one-half gallon.

The number of plants, including vacuum-pump plants, recovering gasoline from natural gas increased from 596 at the beginning of 1917 to 886 at the end of that year, a gain of 49 per cent., and the combined daily capacity of all plants increased during the same period from 495,148 gal. to 902,385 gal., or about 82 per cent.

Place 8-In. Main Across 1300-Ft. Estuary in Single Day

W. M. Henderson Discusses Methods Adopted and Mishaps Met With — Some Difficult Welding Jobs Dealt With Successfully — Purpose of the Construction

The gas industry, among others, heeded the call that sounded through the nation, and early in the development of what is accepted as a new era in the shipbuilding industry offered itself as a true conservor of time and a stimulator of production. Where its service has been accepted this fact is recognized, and among the results to which our company points with pride is the extension of gas service to all the shipyards that have sprung up around San Francisco Bay, states W. M. Henderson, Assistant Engineer of the Gas Department of the Pacific Gas & Electric Company in *Pacific Service Magazine* for October.

The most recent installation on record, and one which involved work of an unusual character, is at the Bethlehem Shipbuilding plant at Alameda, Cal. This

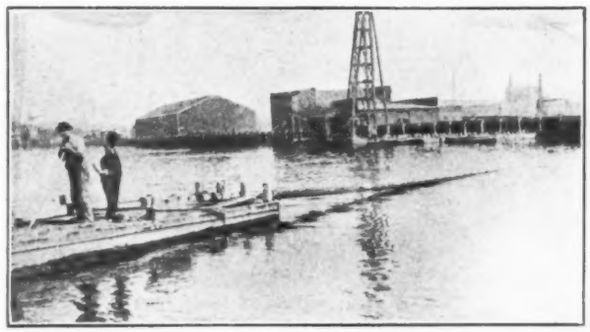
CASTING OVERBOARD A 60-FT. SECTION

plant is in process of expansion and is being provided with the latest equipment and devices to cheapen the cost of production while meeting the demand for increased output. Gas as a fuel will be exclusively used for rivet-heating in the boiler shop, plate shop and on the shipways, for pipe-bending, annealing plates, bending shapes, in the copper shop, for annealing boiler tubes, in the galvanizing plant, for pre-heating torches, core ovens, in the brass foundry and in many other places and ways. None of these features are experimental, but all are in daily use at other plants of the Bethlehem Company, so that they knew what was wanted and how to go about it.

Early in the year negotiations were started to get gas service to this plant. The quantity that was required was estimated at 150,000 cu. ft. per hour. This was so far in excess of the available source of supply in Alameda that it was necessary to go back to the gas works on the Oakland side of the estuary and extend a new main to the plant.

Plant On an Island

Alameda is on an island. To serve it with gas means to cross the water with a submarine pipe, as the bridges connecting it with the mainland are all of the draw



LINE MADE FAST TO TOW BARGE

type. A line was laid out which provided for the installation of about 5,000 cu. ft. of 8-in. tubing from the compressor station at Second and Jefferson Streets to the shipbuilding plant, crossing the estuary at Alice Street. This idea was later altered at the request of the Bethlehem engineers, on account of change in yard plans. A crossing at Madison Street was eventually decided upon.

In laying out the job 8-in. tubing was selected, or rather accepted, as it was available for immediate use. This weight of pipe is perfectly satisfactory when properly treated and installed for general high-pressure gas distribution, but for marine work it is frail and liable to kink unless very carefully handled. Standard weight pipe or extra heavy wrought iron is the only suitable pipe to install for a submarine high-pressure gas transmission line, but when, as in this case, time is of the utmost importance, it is advisable to use what is available.

Trenching in the Channel

The Oakland estuary is navigable and the channel is kept clear by the United States Government. To eliminate the risk of having to move the pipes in the future a permit was obtained from the Government for crossing the channel with the pipe at Alice Street. The depth established by the War Department was the minimum of 35 ft., at low water. This meant to dredge the channel, which averages about 25 ft. It was planned to side-cast the excavated mud, the trench walls to slope so that the bottom of the trench would be 5 ft. wide and the top about 40 ft. This involved moving considerable mud, but by shoring the sides it was possible to retain the trench without danger of filling too rapidly. But about the time the contract was let for dredging the crossing location was shifted to Madison Street, so a new permit was necessary from the Government. The new permit placed a minimum depth of 40 ft. and required the removal of all excavated mud and earth to some suitable dumping ground. These conditions, added to the fact that the crossing at Madison Street

was 1,300 ft. as against 750 ft. at Alice Street, delayed the work and increased the expense considerably. While preparations for dredging and its acomplishment were in progress the assembling of material for the pipe line itself was accomplished and the installation of the pipe as far as the crossing was completed.

This line of 8-in. pipe was all welded and painted with "Floateen," an asphalt preparation, and coated with P. & B. pipe covering, both products of the Paraffin Paint Company of Berkeley. When the line was completed as far as Madison Street preparations were made for the crossing. The pipe was welded together in two lengths, about 700 ft. each; these were tested, then painted and coated with a triple wrapping of the Floateen and P. & B. pipe-wrapping paper. The pipe was capped at the end that entered the water, as it was desired to take advantage of the displacement of the pipe and float it across the channel. Then the first length was mounted on dolly rollers and its nose pointed for its destination.

The starting point for the launching of the pipe was not ideal, as the foot of Madison Street is part of the Santa Fe freight yards. To enter the pipe in the water it was necessary to excavate under four tracks and open a portion of the bulkhead under the wharf. When all was in readiness a line was made fast to the pipe and carried to a tug that was standing by. On the shore a team of horses was hitched to the pipe to help it along. The start was made in the morning and rapid progress was made, the pipe floating out in the channel with ease. The fact that the size and weight of the pipe permitted the pipe to float about two-thirds submerged was conspicuous enough when looking down on it, but from up or down stream it could not be noticed. Considerable trouble was encountered with traffic, so a launch was continually in service to keep boats from endeavoring to cross it. When the first length of 700 ft. had been run in the water a halt was called till a second section could be welded on to the first. This was rapidly done and the pipe again started on its way.

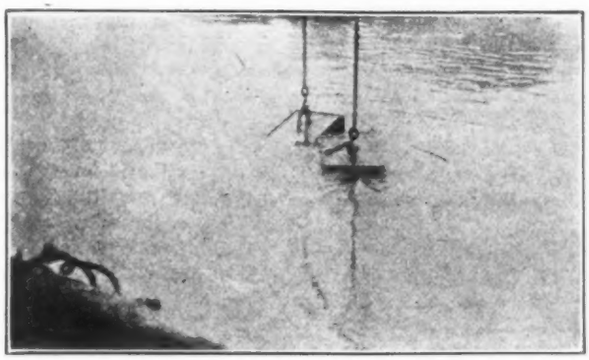
LINE PASSING UNDER RAILROAD TRACKS ON ITS WAY TO THE WATER

Getting Out of the Way of Traffic

Navigation at all times was possible, the channel being clear in front of the tug until it had reached about 90 ft. out from the Oakland shore. At this period fresh water was allowed to enter the line, and as it filled the pipe sank. All the time the tug and horses continued to move the pipe. In this way the channel was opened behind the tug or over the pipe, while the forward progress of the pipe closed the channel on the south side. The water in the line made progress slow, as the pipe in places dragged the bottom; by the time the pipe reached within 200 ft. of the Alameda shore it was necessary to run a line ashore and through a snatch block back to a pile driver. The pile driver then relieved the tug and took up the burden. To illustrate the tremendous pull necessary, a 1¼-in. hemp rope parted when the pipe line was within less than 10 ft. of its destination. So long as the pipe had been kept moving it went along well, but when progress stopped to change the line to the driver it was with difficulty that a start was again made. Nevertheless, by persistent effort and patience the pipe was at last run well up on the beach at the Bethlehem plant.

Here the work stopped for the day. The line was left full of water, the idea being to let it settle properly in the trench and thus find its own resting place. For the next few days work on the shore was carried on and soundings were made with a lead line to determine the location of the pipe in the channel. This was rather difficult out in the stream, as the depth and the mud that rapidly filled the trench made the pipe as elusive as a needle in a haystack. At a point some 400 ft. out from the Alameda side the pipe was found to rest outside the excavated trench; this was due to the difficulty encountered with the tide when the line was floating. At all other points the line was apparently all right and in the trench.

On the Oakland side a wharf had prevented the dredge from excavating the full depth trench right up to the shore line. The wharf was about 40 ft. wide and the water beneath it about 6 ft. deep, which dropped down to 30 ft. at the wharf front. This left a shelf that the pipe lay off from, so that it did not meet the trench bottom for about 150 ft. from shore. As the wharf was not used for dockage, and lay somewhat behind the pierhead line, with the space in front of it more or less spotted with submerged butts of piles,



LOWERING THE WEIGHTS TO HOLD LINE ON BOTTOM

THE STARTING POINT ON MADISON STREET

it was considered safe to let the line lie as it did for the time being.

Cold Water Test

While work and preparations were going on for tying in the line, installing the drips, and placing the weights on the pipe before removing the water, observations were made of the pipe line. No change was noted, so evidently it rested from the first as deep as it would ever sink; but it was noted that the pipe lying out from the Oakland shore was not as secure as had been expected, and that at time of low water it was a possible menace to navigation, or, more likely, navigation a menace to it. So it was decided not to wait any longer for its settlement and, also to abandon the idea of installing a drip on the Oakland side; instead, to at once raise the line, cut it and place an elbow in it so as to bring it to the wharf in the bottom of the dredged trench and then up and under the wharf to the line on shore. This would make a better job. Once decided on, no time was lost in rigging up to accomplish it.

It was a very difficult piece of work and could only be done at periods when the tide was favorable. A boom was made fast to the wharf and hung out over the water directly over the pipe. A cable was made fast around the pipe and a lift taken, just enough to raise the pipe above low tide. It was then cut outside the wharf, the proper point determined by measurement. To the submerged pipe was then offered an elbow with about 28 ft. of pipe extension and an elbow at the other end. To say the least this was rather awkward to manipulate and weld to the end of the line protruding from the water. When accomplished, tested, painted and wrapped it was lowered to place and the upper elbow tied into the shore line. By this time the valves had been installed on shore, so all was ready for the test of the line. The weights not having been placed on the line a cold-water test was only possible, as the line was still full of water.

Repairing the Breaks

A suspicion prevailed that all was not well, and so, when the test developed that the line was broken about 150 ft. from the Oakland shore, it was accepted with the best of good grace, for it simply postponed the completion of the line.

During the time that the elbow was being installed the weights were made for sinking the line. These were made of concrete. At first it was hoped to cast a block to weigh about three-fourths of a ton when submerged. Two eyebolts protruded from the tops of the blocks, so that slip hooks would pick them up. A derrick barge and diver were to be used in placing the weights. After a diver had been secured to examine the broken pipe a first-hand impression was obtained of the bottom of the ditch and the way the pipe lay. Rather than chance the laying of weights on the pipe it was decided to join the weights together with wrought iron chain and then lower them so that the weight would hang like saddle bags over the pipe. Twelve double weights were made and finally placed about 100 ft. apart, the total weight being about 100 per cent. in excess of the weight of the water displaced by the pipe line. The repairing of the break and placing of the weights were in order immediately as the Bethlehem plant was rapidly getting ready to utilize service. A derrick barge, diver and about six deck pontoons, launch, skiff and plenty of tackle were provided. The line was again cut under the wharf, the boom used to pick up the pipe at this point. The derrick barge moved out in the stream and with lines out to shore held a position to pick up the pipe. Three lines were dropped into the water from the shackle of the sheave on the boom. The diver found the pipe end and placed a line, then moved along and placed a second and third. The pipe was then lifted from the bottom and made fast to the pontoons. The pontoons were so rigged that two were fastened together by a superstructure, with a piece of 8-in. pipe extending over each. This pipe with the aid of chain tongs could be used as a windlass. In this way the pipe line lay between two pontoons and could be raised and lowered at will.

Ship Did the Damage

The derrick now moved out farther into the channel and proceeded to raise the other end. It was necessary at this point for the diver to work through eight feet of mud before he could reach the pipe. The raising of this end of the pipe was easy, for it developed to be a length of sixty feet broken out of the line. The first break upon examination indicated that it had been struck, without doubt by a ship. The second break had evidently been caused by the same blow, as the pipe about sixty feet in shore from the first break showed a kink. This kink and the break farthest out were due to the bending of the pipe when the boat struck it.

The 60-ft. piece was brought ashore and the ends,

which had been crushed to an elliptical shape, were cut off and a sufficient length of pipe welded on to replace them. When all was ready again it was cast overboard onto two pontoons and floated out to place where it was welded to the piece that had already been lifted.

This was as difficult a job as has ever been attempted in welding gas pipe. The ends of the pipe were brought together between one of the double pontoons and fastened with a home-made pipe clamp somewhat on the principle of a belt tightener. This rig held the pipe ends rigid, but the difficulty of welding was hard to overcome on account of the wash of every boat passing up and down the estuary. This same constant rolling of the pontoons made it a trial for the welder to hold the torch steady in cutting the ends. In welding it was necessary to go around the pipe, that is, make an upside-down weld, as it was impossible to turn the pipe. In doing this the welder's head was partially submerged in the water. That the job was accomplished was due to the persistency of some men.

The scene of action now moved out farther in the stream, the next break being over 200 ft. from shore. The derrick barge took up its position and the same idea was followed. The driver made fast the lines, the first one about 50 ft. back of the pipe end, the next 40 ft. back of it and another 40 ft. farther out. These lines were maintained at different lengths so that the pipe would come up on an angle. Out beyond the last line a pontoon was placed, rigged so that it would take up the strain as the pipe was lifted. The fact that the pipe must be lifted over 40 ft. to clear the surface of the water made it necessary that every precaution be taken so that it would not kink. All the lines were maintained tight. This was accomplished by the diver as the lifting proceeded. The object of taking the first bite of about 50 ft. back of the end was that the end, on coming up, would point down and any mud would be washed out of the pipe end. Also, by handling it this way the length of 50 ft. was quite limber and easily managed in making up to the floating pipe waiting to be joined to it.

Weights Placed

As the barge was so far out from the bank it was difficult to keep it stationary with the lines from the shore, and the anchor was useless on a falling tide. So care had to be taken in selecting the proper time to do the work. Through a late start one day's work was lost after the pipe had been picked up. At the next attempt more speed was made, and before the tide ebbed the pipe was brought to place, the damaged end cut off and the weld made, making the line once more complete. Before lowering the line a test was made of the two joints under pressure; found to be tight, they were painted and coated. Lowering was easy; water was run into the pipe while the lines were slacked off. So far so good. Work with the derrick barge had started on Wednesday, and this was Saturday night.

The following week the placing of the weights was to complete the job. On Tuesday the derrick barge, loaded up with the concrete weights, cast off from the wharf. To properly place the weights a bridle was made with a span of about 6 ft. and a slip hook hung from each end. In this way each weight would be picked up with the connecting chain hanging loose. The boom would swing the two weights out into the water and lower them; the diver would then go down with a leader line to the weights and locate the pipe. The boom would swing into place, and after a struggle, and sometimes without, the weights would be placed astraddle the pipe. The best time made to properly place a weight was thirty minutes; the longest was four hours. Sometimes the pipe would be up against the bank; in such cases it was very trying to get the weight astraddle of it Most of the trouble and struggle was with the tide, as it was hard to hold the barge when the tide was running.

On the first day of placing weights a misfortune occurred. A cable snapped on the barge and shackles, sheave and cable boom were lost overboard; and, on top of this, the anchor line parted. The placing of but one weight was accomplished on this day. The next day the barge was not available, having been removed during the night to other work. The day was lost, but the barge was found and brought back to the job ready for work on Sept. 12, registration day, and the day it rained. This day in the rain six weights were placed and when through the driest man on the job was the diver.

Shipbuilders Find Time to Be Annoying

Next day everybody was "up and at them" to finish the job. All the weights were now placed well out beyond the center of the channel, so the barge moved over to the Alameda shore to work out. The first difficulty encountered was foreign to the job; the barge lay directly in front and under one of the hulls under fabrication in the shipways. The rivet heater boys took to amusing themselves by tossing hot rivets at the driver's tender and pumpmen. No harm resulted, but for the time the atmosphere was unpleasant.

This day proved the toughest of all before it was over. The first duty to perform was to locate the place where the pipe line was out of the ditch and to pull it back into place. The diver soon located the place and found about 40 ft. of pipe lying on top of the bank. Great care had to be taken in pulling on the pipe, as it was imbedded in mud. By moving the line along the pipe after each tug the pipe was brought to the edge of the ditch, into which it slid of its own accord. Half the day was spent before any weights were placed, so a full day's work was left to do in the afternoon. The first weights went overboard at the rate of one every forty-five minutes, and it looked as if we would "knock off" early for once. But along about 4 p. m. luck changed with the weather; the rainstorm broke, and the sun now shone. In contrast to this, things looked black to us. The pipe was found out of the ditch farther out in the channel. The tide was now running out strong and it was hard to hold the barge, as the anchor line slackened and the lines to shore were about 400 ft.

Removing Condensation

When the line from the boom would be fast to the pipe the barge would swing on this bite, for the pipe was well anchored in its covering of mud. To accomplish anything at all an attempt was made to tow

the barge with the tugboat and at the same time keep the line fast to the pipe. Tug and tide did more than we bargained for, as the pipe was pulled clear across the ditch before the barge, caught by the tide, could be brought to a halt. This little struggle consumed the remaining daylight. But one weight remained, so it was not time to quit even though time and tide were against us. The same trouble continued in the fast-running tide; the anchor line would continually slacken and the line from shore was too long to be of much service. The tug only was of use, as the barge would swing on the line from the boom to the weight. Not being able to keep the barge lines taut, it was almost impossible to swing the weights, as the barge instead would move. At last, with persistent effort and perseverance, the last weights were landed astraddle of the pipe.

The idea on the submerged pipe for removing the condensation was simple. It was intended to extend into the pipe line from each shore about 500 ft. of ¾-in. pipe, through which, with the pressure on the main pipe, any liquid could be removed. It was difficult to determine the lowest point on the line, but as very little condensation was expected the matter of drips was not of great importance. At any rate, it was always possible to blow the line clear, for 40 lb. of pressure was available, an amount sufficient to raise any liquid a height of 85 ft., whereas the total head from maximum depth of line to blow-off is not in excess of 60 ft. The drip on the Oakland side only was abandoned. The line was blown clear through the 8-in. valve. On the Alameda shore this was easy with the 40 lb. of air pressure maintained back of the water in the line.

When it was certain that all the water was out and the line tested O. K., the gas was turned on. The line was purged of air in the usual way and everything was left ready for business.

The Bethlehem Shipbuilding Company established a station in the yard close to the water edge. In this station are located four Selas machines for premixing the gas before distribution through the works. In this building are also stationed meters and governors.

The Temperature of Luminous Flames

The temperature of luminous flames can be determined, says *Engineering*, by two methods—either deduced from the laws of radiation or by measuring the temperature which is assumed by bodies introduced into the flame. But both these methods are open to objection.

In the latter method, our contemporary remarks, the objections are that heat is lost by the body through conduction and radiation, and that the body itself cools the flame into which it is introduced. To overcome the first objection heat is imparted (generally by the electric current) to the body while in the flame, at the rate at which the heat is lost. The point is to determine the amount of heat required to establish stable conditions. This is possible in the case of the non-luminous flame of a bunsen burner, but not when the flame is self-luminous, because it contains glowing particles of carbon or of some other substance. Dr. H. Senftleben and Miss E. Benedicks, of Breslau, have, however, found a criterion which makes the electric-heat compensation method applicable for flames containing incandescent carbon particles. They argue that the carbon will only be deposited on the body introduced (mostly a wire), when the wire is colder than the flame. If the flame and wire are at the same temperature, there should be no deposition of soot—a questionable assertion, but the soot should at once appear, when the wire temperature falls below the flame temperature. Thus they regulate the temperature of the platinum (or gold) wire they use for their experiments until the soot deposition ceases; and at that moment they determine the "black" temperature of the wire by means of a Holborn-Kurlbaum pyrometer, and then find the "true" temperature of the wire from the known reflecting power of platinum at different temperatures.

Applying the method first to the Hefner standard candle (amylacetate lamp), they found a temperature of 1705 deg. C. absolute, correct probably with 20 deg. In this determination, the influence of the radiating part of the flame between the instrument and the wire was, however, disregarded; but there is, on the other hand, an absorption of the radiation from the wire by this portion of the flame. The two factors would oppose one another. Senftleben considers that the influence is small, but that in the case of the Hefner candle the true temperature would probably be reduced by one per cent.—*i. e.*, to 1690 deg. C. absolute.

To study the further disturbing cooling influence of the introduction of the wire, they experimented with wires ranging in diameter from 0.2 mm. up to 1 mm. They observed a slight cooling influence only with the thick wires. Platinum and carbon are known to combine, however, at high temperature. Any direct influence of this combination was not observed; but it was found that, after using the same wire several times, the soot-deposition became less distinct.

Further, to investigate this point, they took gold wires instead of platinum wires—gold not being liable to carbide formation. In these experiments, ordinary oil-flames were also used, more or less sooty. The determination of the temperature of the Hefner candle gave the former value 1690 deg. C. absolute. The influence of carbide formation likewise would therefore appear to be small. This value is also in fair agreement with other determinations previously made by Kurlbaum (1711 deg.), Ladenburg (1688 deg. and 1715 deg. by different methods), Becher (1680 deg.) for the temperature of the Hefner flame, and may thus be accepted. It should be noted that the temperatures stated are absolute. On the ordinary centigrade scale the melting point of platinum is assumed to be about 1783 deg.—*Gas Journal.*

2000 Employees of Ohio Cities Company Subscribe for Fourth Liberty Bonds

Two thousand out of 2,800 employees of the Ohio Cities Gas Company have subscribed for Liberty bonds to date. The company carries the necessary loans to make many of these subscriptions possible.

HAROLD E. HUGHSON, formerly employed by the New Haven (Conn.) Gas Company, has been killed in action in France. He was 23 years old and a member of a machine gun company.

Natural Gas Production in West Virginia Shows Falling Off

Gas production in West Virginia in the fiscal year ending June 30, 1918, was 16,040,535,000 cu. ft. less than in the year previous, according to the report of J. K. Anderson, chief engineer, to the public service commission of that State. Consumption of gas in the State was 1,844,000 cu. ft. less than in 1917; and the amount of gas transported out of the State was 6,577,555,000 cu. ft. less than the year before.

Place Temporary Line On Suspension Bridge That May Not Be Able to Carry Load to Assure Dallas of Gas

A temporary 6-in. line was installed by the Lone Star Gas Company on the Byers bridge, a suspension bridge three miles above the place where the Keyes field line crosses the Red River, which is not considered by the company any more than doubtfully strong enough to carry the load, as a rather desperate effort to supply Dallas, Tex., with sufficient gas. By extraordinary efforts on the part of both laborers and the gas company officials, the line was completed and the gas turned on from the Keyes field.

Gas from the Keyes field in Oklahoma reaches Dallas and Fort Worth by way of the Petrolia field, which is on the Texas side of the Red River. One hour after the gas was turned through the line across the bridge, the gas pressure at Petrolia was 100 pounds, and at 9 o'clock it was 140 pounds. Five hours was estimated as the time required for the gas to reach Dallas from the new field in considerable quantity. Mr. Lege said the line across the bridge is only temporary, and that the bridge is no more than able to bear the weight of the line. It really has to bear the weight of two lines, as it was necessary to place an extra line on the bridge to balance the weight of the one carrying the gas.

Industrial plants will not be permitted to use gas immediately. Since the break in the pipe lines across the Red River occurred, the gas pressure in Dallas has been about two pounds. The pressure is expected to reach forty pounds.

"The arrangements which have been made to relieve the gas shortage are, of course, only temporary," Mr. Lege said. "We have been having a hard time making the connection at the old crossing on the Red River to Fox field, which is in normal times the chief source of the gas supply for Dallas. It is probable that connection will be made within the next few hours, but I can not say for sure. If connection is made, then the supply of gas for Dallas will be plentiful.

"Work will begin immediately not only to replace the old lines to their condition before the rise in the Red River washed them out, but to make improvements which will absolutely prevent any such occurrence in the future, no matter how large the rise may be.

"In all probability a bridge will be built at the crossing to the Keyes field. If so, it will be a heavy 50-ft. wood piling, and will have to be between 3,000 and 4,000 ft. long. A cable span will be built across the river at the crossing to Fox field, commonly known as the Gainesville crossing.

"Work to permanently repair the existing lines will be started at once. We are somewhat handicapped as to labor, and it may take some time to get the material, but the work will be rushed.

Hold Your Liberty Bonds

Next to the imperative duty of American citizens to support the Liberty loan is their duty to hold their Liberty bonds. It is not full service to the country to purchase Liberty bonds and then throw them upon the market, thus putting upon others the real burden of financing the war. Unless the necessity for disposing of them is very great, every owner of a Liberty bond should hold fast to it.

Holding onto one's bonds means that one has not only lent so much money to his Government, but also that he is not spending that money for goods, labor and transportation needed by the nation in the prosecution of the war, and is thus leaving the resources of the country more freely at the disposal of the Government as well as giving it financial backing. This is a double service.

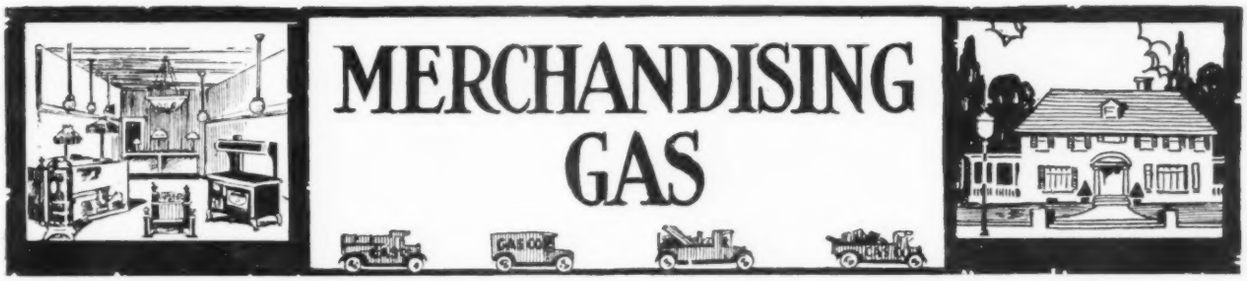
Secretary Baker says that the wide distribution of the Liberty Bonds amongst the mass of the American people makes our Liberty loans the soundest national financing in history. It is a good thing for every Liberty Bond holder to be a creditor of his or her Government, and it is a good thing for the nation for its obligations to be widely scattered amongst its citizens and not congested into the hands of the rich. It is a most hopeful thing for the United States that the best investment in the world, the Liberty Bonds, is very widely distributed amongst millions of its citizens.

Judging the future by the past, our Government bonds issued during the war are going to rise greatly in value with peace. In 1888, 4 per cent United States bonds sold in the open market as high as $130, and in 1901 brought over $139—that is, $139 and some cents for a $100 bond. That the Liberty Bonds are going to rise well above par in value is something that the most conservative will admit is well within the bounds of possibility.

The shrewd and unscrupulous, the birds of prey in finance, realize the worth of Liberty Bonds, and are going to use every effort to secure them from the hands of those owners of them who are uninformed or who are ignorant of stock and investment values. The favorite method will probably be offering stock of wildcat companies or other speculative ventures. Speculative is really too conservative a word to apply to some of these stocks, since to say that they have a speculative value is flattering in the extreme; they have no value at all, except in the hands of unscrupulous people, who trade them for money or Liberty Bonds to ignorant investors.

Some of the get-rich-quick schemers propose not to trade their gold-brick stock for Liberty Bonds but to lend their clients money to buy their stock, taking Liberty Bonds as security. This is camouflage—only a thinly disguised method of securing Liberty Bonds for worthless or near-worthless stock.

Every holder of a Liberty Bond before he disposes of it, and especially before he trades it for stocks or other bonds, should consult a bank. Much money will be thereby saved to the owners of Liberty Bonds and the finances of the American people be better conserved.



Many Sales in Scattered Communities Traced Directly to Demonstration on Atlantic City's Boardwalk

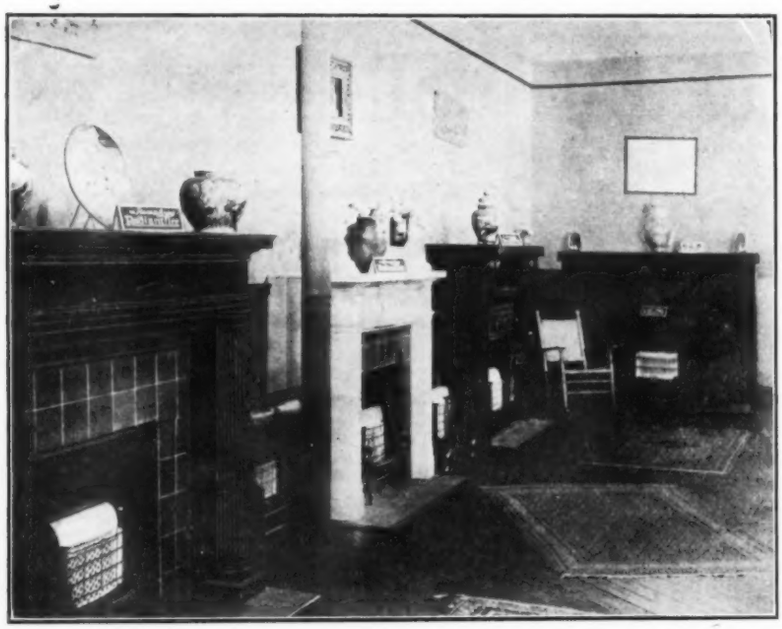
General Gas Light Company Demonstrates The Humphrey Radiantfire in an Attractive Store at America's Great Beach Resort — Demonstration One of the Strongest Links in Publicity Campaign

If you've got something to sell —especially an article on which you want to get national distribution—take it to Atlantic City, N. J. Open up a store on the boardwalk, a fine store—not a hole-in-the-wall. Stage your merchandise right. Give it the correct atmosphere. Get an attention-drawing sign on the outside; then watch your crowds come. They'll come. Never a fear about that. That boardwalk on Atlantic City's beach is trod by thousands from all the States in the Union seven days in the week. It is the one beat, the one and only highway. It is pounded by the idle, curious crowd day and night—all while the ocean voices its ceaseless and enchanting roar!

The Section Considered Select

This is the way the General Gas Light Company staged a demonstration room for the Humphrey Radiantfire on the famed boardwalk: The room was opened in the late summer. In the first place, the location selected was perfect—right in front of the Chalfonte Hotel, that famous hostelry which has housed the great, the near-great and the rich or pretending-to-be-rich, for years and years. All the boardwalk patrolers promenade as far as the Chalfonte—and beyond. It is a section that is considered "select." That is why the promoters of the Humphrey Radiantfire chose it.

The showroom — parlor would better describe it—was artistically furnished and cleverly lighted. A gas company would be expected to see to correct lighting. There were fine rugs on the floor. All the appointments were as nice as any home could have. Several beautifully designed mantles were installed. In each was placed a Radiantfire. Different models were used, showing how possible it was to harmonize the Radiantfire with various kinds of home decorations and finishing.



CAPITALIZING THE OCCASIONAL COOL SPELLS

Outside, a sign that couldn't be overlooked by passers-by bore the legend "Wonderful New Discovery in House Heating." The Humphrey Radiantfire trademark was also emblazoned on the upper part of each store window. Other catch phrases telling of the merits of the Humphrey Radiantfire were cleverly shown. The big sign and these auxiliary legends inevitably caught the eye and aroused the curiosity of the day and night Boardwalk pedestrians. By night the glow of the Radiantfires, seen from the outside, was nicely calculated to show up the fires.

When all was set, everything happened just as planned. Atlantic City is a mecca for "tired business men," rich people who hunger for the roar of the sea; people who are not rich but can stand the price of a jaunt to so famous a resort—all sorts of people of the upper and middle class—folks who have homes that they long to get away from betimes, but which they snuggle into when the summer playtime season wanes. This is just the kind of an audience that The Humphrey Radiantfire wanted to play to. There are occasional cold days at Atlantic City all through the summer season. The cool nights are still more numerous. On such days and nights, with the nip and chill of the ocean's breezes, the sight of a fire is great. If there is anything to beat a flock of fires, such as were on view at this Radiantfire show, we don't know what it is.

Thousands of names were secured, all of which were promptly referred by the General Gas Light Company to their dealers back in the towns where the people lived. A big percentage of those who first saw the Radiantfire at that Boardwalk demonstration parlor have since purchased one or more Radiantfires. And for every one they purchased themselves there have been many other buyers. It seems to be a very human trait to tell others when we discover a good thing. When we "fall" for advertising and selling and find that we have gotten something that is all it was "cracked up to be" we generously tell others about it. Or, maybe, we want to confirm our good judgment by seeing others follow suit. Anyhow, the Humphrey Radiantfire made good. It was a timely savior for a cold-threatened people. It was attractive, distinctly different from any other gas heater ever seen. It was more efficient and was odorless. So the Boardwalk show was a huge success. The audience demonstrated to were from far and near. The follow-up was timed right. The results were all and more than expected.

Simultaneously with the Atlantic City show a national advertising campaign was launched by the General Gas Light Company. Dealers co-operated by local advertising, using clever copy furnished from headquarters. Sheaves of orders and repeat orders resulted.

All of which shows how demonstrating, and a co-ordinated, co-operative advertising campaign is a sure salesmaker for a good article.

The Atlantic City show was one of the strongest links in the campaign which sent the Humphrey Radiantfire over the top with a rush.

Street Light Contracts for St. Paul Awarded

Contracts for electric and gas lighting of streets, parks and other public places of St. Paul were awarded to the St. Paul (Minn.) Gas Light Company by the city council recently at the same prices the company now gets for its service.

One contract gives the company $10.50 for each gas lamp per year during 1919. The amount involved is estimated at $42,000.

Milton S. Branditz Dead

The gas appliance interests of St. Louis lost one of their best known and best liked members recently when Milton S. Branditz, manager of the hotel appliance department of the Majestic Manufacturing Company, died of double pneumonia following influenza.

Mr. Branditz was responsible for the installation of complete gas-fired kitchens in some of the best hotels in the country. Although the company with which he was associated also manufactures coal ranges for hotels and other purposes, Mr. Branditz was without a doubt as ardent an advocate of the gas-fired hotel range as ever lived.

American Water Heater Company Files Bankruptcy Petition

A voluntary petition in bankruptcy has been filed in the United States District Court at St. Louis by the American Water Heater Company, of 1106 North Sixth Street, manufacturers of gas-fired water heaters. The petition lists liabilities of $36,000 and assets of $71,000. Of the latter $51,000 is said to be in stock and the balance in machinery and supplies. The decision to ask for a receiver was reached by the board of directors of the company. Albert D. Nortoni is attorney for the company.

Where the Commercial Department Has Been Submerged Almost to the Point of Extinction Why Not Build Anew from the Bottom Up?

The Bungling Manner in Which the Commercial Problem Was Dealt With in the War Emergency a Matter Many Managements Would Like to Forget, But with Proper Action Now the Mistakes That Were Made May Prove the Means of Benefits to Come

By S. G. ADDISON

Some gas companies, when the normal comes, will have preserved enough of their former commercial departments to start off promptly at the point they left off as if nothing so serious as war had intervened at all. Some think they have retained the nucleus of a commercial department, and are mistaken. Others have made no pretence of so doing.

We Were Not Really Making Steam, We Were Only Sputtering

In the writer's opinion about the worst thing that could happen in the gas industry would be to immediately start up again where we left off in the commercial end, and on the same basis.

Merchandising in the gas field is a comparatively recent innovation. We went into it hurriedly—were rushed into it—and like most rushed jobs we made pretty much of a botch of it. There was a great deal of hurrah stuff, but blamed little effectiveness. With the best product in the world to sell, we confined ourselves to selling sheet metal and brass.

We were engineers and were told we didn't know anything about selling. Make the gas, but for goodness sake don't try yourself to market it, they told us. For selling get real sellers. Get men who have made selling a specialty.

So we got them—real, honest-to-goodness salesmen. And we treated them right—made some of them commercial managers even, and left it to them to handle the whole works. My, but we were a diffident lot.

When one thinks of the disrepute some of these gentry, with their big knowledge of selling and scant knowledge of appliance efficiencies, brought upon the commodity we have given our lives to improving, one is tempted almost to wonder at the credulity of man.

They sold heaters—yes, and gas lighting and industrial appliances. But too often they sold the wrong one for the particular purpose intended. The sales returns were excellent, but there were not a sufficient proportion of repeats to give one much confidence in the stability of the business. Some of us believed, like Mr. Barnum, that a fool is born every minute, but Mr. Barnum had the world to range over. He could be operating in new territory while a new crop was maturing in a section already exploited. We were confined to a more limited range. We would soon have come to the end of our rope on first sales prospects—then the deluge.

We were not really substance in the commercial sense. We were merely froth. We'd go half way across the continent to obtain enlightenment at an association convention, and come back and talk of the entertainment features. The papers were an incident, the canewalks down the boardwalk, the swimming contest, in the Casino, the boiled-shirt affairs—they were the important things.

The war has destroyed all this by destroying in general the commercial organizations. Why not take advantage of the opportunity to build completely anew, and build right? Let us cease being hypnotized by the selling specialists. We want first, men who have some technical knowledge of gas, its behavior under various conditions and its efficient application. After that the question of selling ability is important. The combination exists in many men, but it will take a decent though not extravagant compensation to obtain them.

Sale of Flexible Tubing in New York City May Be Regulated by Ordinance

The sale of flexible gas tubing in New York City would be regulated by a proposed ordinance submitted by Commissioner of Health Copeland and now pending in the board of aldermen. This ordinance goes into great detail as to specifications of construction, labeling, strength, flexibility, tightness, resistance to heating, tensile strength of rubber ends, elasticity and metal terminal fittings. Power to inspect, condemn and seize would be vested in the commissioner of water supply, gas and electricity.

Lightless Nights Suspended in Missouri

Announcement was made Nov. 12 that the lightless night regulation in Missouri has been suspended indefinitely.

Influenza Claims Another Important Worker in the Welsbach Company's Ranks

Thomas U. Flanner died at his home in Battle Creek, Michigan, on Nov. 9. He was stricken with influenza about one week before his death.

For the past seven years Mr. Flanner represented the Welsbach Company in Michigan, making his home at Battle Creek, where he first became identified with the gas industry. For six years he was with the Battle Creek Gas Company in various capacities.

In 1908 he left to go with the United Light & Railway Company as superintendent of manufacturing and distribution of their La Porte, Ind., plant, remaining with them two years. From there he went with the Hattiesburg, Miss., Traction Company as manager of their gas department.

His connection with the Welsbach Company, Gloucester, New Jersey, dates from August, 1911.

Mr. Flanner read a paper "Gas Mantle Business in War Times," at the last Michigan State Gas Association meeting held in Detroit, September of this year.

Mr. Flanner is survived by a widow and one son.

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The War at End

Word has come that Germany has surrendered. The war to all practical purposes is at an end.

For four years complete contentment has been denied the entire world through a mad dream; a war, unnecessarily, criminally, started. Now it is ended and the aggressor on the way to punishment.

Will the cloud on our minds pass quickly away? Glance at the face of the man in the street as he read what should be overwhelmingly glad tidings. It is not to be. The wound will heal, but the scar will remain. There has been too much misery, too many horrors, for the present generation to forget. Minds have been irreparably molded to grave thoughts. This generation can never hope to be blessed with complete cheerfulness of mind that would otherwise have been its due. The Hun has been conquered, but the cost of conquering him, not in money, but in the joy of living, will still be in the paying for close to a century to come. It is the price the present generation must pay for the privilege of having lived in the greatest moment of the World's history.

The Journal Moves

As we write, our eyes fall on a depression in the floor. It is a hardwood floor and the depression is more than a half inch deep. It was made by the friction of a typesetter's feet.

In the days when each letter that was printed in the JOURNAL meant the handling of an individual piece of metal from a case all the way into the forms and back again into the case, this room was occupied by the typesetters. One man's table was opposite the spot where the depression now is. He stood directly over it.

It took many years for a man's feet to wear that depression into the hardwood floor, and its presence there and a knowledge of its history enables one to comprehend the closeness with which the name AMERICAN GAS LIGHT JOURNAL—now the AMERICAN GAS ENGINEERING JOURNAL—is associated with the address, 42 Pine Street.

But even this does not truly indicate the duration of the connection. To the passerby in the street 42 Pine Street is an old building; to the JOURNAL it is a structure of yesterday, for the JOURNAL had moved out from a building on the site of the present building to await the razing of the former and the erection of the latter.

For years it has seemed to the JOURNAL that its needs in the way of office space were but inadequately met in its quarters at 42 Pine Street. Times change, so do conditions. The erection of giant skyscrapers in the vicinity more and more shut off the natural light available to its working forces. What were once ideal quarters became merely back rooms.

But never could those in control of the JOURNAL's destinies arrive at a definite decision to move. There is

sentiment, memories, entwined in every fixture, in every nook in our present rooms. Perhaps voluntarily we would have remained at 42 Pine Street until the building was torn out under our feet.

But the decision has been taken from our hands. A mercantile bank whose needs have grown has taken over the entire building. We and our generations--old neighbors—must gather together our dusty trappings and move.

So with mixed emotions we announce that after November 23 the offices of the AMERICAN GAS ENGINEERING JOURNAL will no longer be at 42 Pine Street, New York City, but at 150 Nassau Street, New York City. We realize that the efficiency per individual employed will be increased by the change and improvement in working conditions represented in the new location, yet there is a tendency to regret as we leave behind the old walls and the memories they hold.

The Commercial Situation As We View It

Since the early days of the war we have given very little thought to the commercial department except insofar as related to curtailing its activities or still further cutting down its personnel. But to all practical effects the war is over. In many lines of merchandising the effect of cessation of hostilities will be very slight in the immediate future. But the gas industry has been shown to be pre-eminently essential in war. It is no less essential in peace. As the guns are grounded the peacetime gas industry must promptly renew its normal activities.

The stockholders of a gas company are greatly concerned with a distinct dropping off in its load. The general public is even more concerned. To it it means, inevitably, higher rates or less adequate service. It is a contingency that must in any event be forestalled.

We must plan to promptly renew merchandising activities. But we must renew them in a more efficient manner than we were conducting them when we left off. In a general sense it may be stated that we no longer possess merchandising organizations. We have reduced them almost to the point of extinction. In reorganizing we are presented with the opportunity of starting completely anew, avoiding the mistakes of the past and profiting by the experience we have had.

We in the gas field were mere amateurs as merchandisers. We were merely playing at the game. We got good results, it is true, but it must be remembered that we were selling a *necessity*.

Recognizing the importance of the moment and the opportunities that exist of revolutionizing past practices with the minimum of friction, the AMERICAN GAS ENGINEERING JOURNAL has arranged for and will publish considerable discussion on the weaknesses of methods hitherto followed and constructive suggestion as to readjustments that should be made. The material it has in sight is sufficient to render a most valuable contribution to activities along these lines. But cooperation on the part of its readers who may have something to add will be appreciated greatly and may be the means of starting the gas industry on the efficient merchandising career that none will gainsay is absolutely essential to its attainment of its proper sphere of importance in the social and economic life of the Nation.

Of What Avail Is Discussion on Various Systems of Compensating Salesmen When the Total Returns Under Any of Them Do Not Provide a Man's Living?

Salesmen have again become a matter of moment in the gas field. Some of the markets which have been overstraining us in the immediate past will begin to fall off. We must take measures to replace them.

The pivot around which all problems in regard to gas company merchandisers revolves is the problem of compensation. We have recognized this in the past—have prepared, read and heard many papers on systems of salesman compensation. A few of us took the pains to examine some of these papers in detail. Then our eyes opened. We discovered that, regardless of the system, straight salary, commission, salary and commission, etc., the net possible return to the average salesman could not exceed greatly fifteen hundred dollars a year.

What man who should dress as the gas company's salesman should and who is developed intellectually and in his social mannerism and tastes to the point where he may be able to personify the company in the eyes of the public, can provide a decent living for a family on such an income? It might do for a boy working his way through college, and it is recognized that there are particular seasons when a salesman, working on commission, can make a return much larger than the monthly average in the figure given. But the gas company cannot afford to have its sales organization composed of transients. What it needs are all-year-round men enthusiastically loyal to it.

A man must be given a realization that sales work is not merely a temporary job which he can afford while single, but a lifelong opportunity in which he can grow from year to year and in which he can expect, dependent upon his own efforts and ability, to increase his income in proportion with the increase in his expenditures necessitated by the greater needs of a growing family.

The AMERICAN GAS ENGINEERING JOURNAL does not propose a mad carnival of salary raising, of employing untried youngsters offhand at fabulous salaries. It does contend, however, that if we expect men to exert their minds to improve their efficiency to us, we must

forget all thoughts as to what salesmen, as a bulk, should be worth and figure more on the basis of what they *can* be worth under proper inducements.

The Present a Poor Time for Random Insinuation

In the old days—the easy days when people's hearts were not torn by the maiming and killing of their kindred; when the hardest-worked of all of us still had plenty of reserve vitality left even though we did not think so; when we were not denying ourselves indulgence in foodstuffs, in clothing and in coal, with consequent discomforts—in the good old days, we say, when our nerves were not strained to the last notch and our tempers were not continually tried to the breaking point, the country used to go to the dogs every four years, the legislators who were finishing their terms were blackguards, and everyone except those who were not *in* was the last word in infamy. Those were safe days when we could challenge the integrity of anyone and everyone without the danger of someone misunderstanding to the point of rashness. It was our crude way of politics.

In those days the pathway to the limelight was easy to find and the process of getting into it comparatively simple. All one had to do was to challenge the purity and disinterestedness of motives of someone already prominent and the trick was done.

We all like to tear down the pedestal of someone who has gotten up.

It was a somewhat stupid, unoriginal method, but it worked consistently and no one was particularly hurt. Even the notables whose characters were besmirched continued to move about complacently in society without impairment of prestige, for, in those days, we had a sense of humor.

But, evidently, by countenancing this sort of thing we set a bad precedent. Those who have learned how simple a means this method supplies for attaining their ends are apparently somewhat slow in understanding the changes time has brought about The present is no time for irresponsible mudslinging, for unfounded insinuation. Such transgressions are not now amusing. They are dangerous.

For more than four years the world has been aflame. Doubts enter all men's minds. The accusation that yesterday was laughed at to-day we take seriously. So great a depth of falsity has been revealed to us that we sometimes wonder if anything is clean and honest and good.

Some time ago we received a letter from a public service commissioner that was replete with insinuation and innuendo. We tried to sit back and visualize what would be our emotions were we to believe true everything this letter insinuated. The feeling was one desperate despair over purity of things and the baseness of mankind. It was a feeling that would be dangerous to the community were it to be stirred up in the breasts of a considerable number of men at the same moment. Because we knew from real knowledge that these things were not true, could not be true, we were able to realize the danger of too great a number of such insinuations flying broadcast. The man who wrote them did not realize the possible consequences of what he was saying. His mind has been slumbering while the world has been changing. There was no harm in stamping everything as rotten five years ago. There is real danger to-day.

The type of mind that is most credulous in accepting such insinuations at face value is also the type of mind that will be stirred to rash action without thought of consequences. To so stir it for the purpose of achieving a selfish end is about the most unscrupulous crime an intelligent man can commit against a less fortunate brother.

A few days ago, our news columns tell us, a city attorney was most bitterly rebuked for loose talk impugning the integrity of his State's public utilities commission. When confronted by those whose honesty in guarding the public interests he had challenged, this attorney had little to say.

He has been merely talking wild, indulging himself in a time-honored means of attaining notoriety.

Of course, he could not substantiate his charges. He never expected he would have had to.

The language addressed to him was somewhat more forcible and violent than one is accustomed to associate with the chambers of public utility commissions, but none will say it was not justified. If they had ridden him on a rail one would be more inclined to feel, in these serious times, that the penalty would have fitted the offense.

Consider what it would have meant to the people of the State in question if what this attorney had said had been generally believed. To whom could they turn for protection of their interests if the body appointed for the purpose was untrue to its oath? Distrust of everything breeds discontent of the most dreaded type. And if every wild statement that has been uttered by men of supposedly responsible judgment had been true there is nothing we could believe was what it ought to be.

All should be guarded in utterances that reflect on the integrity of public officials, and public officials should be sure of their facts before they question the conduct or motives of corporations and public utilities. We know, of course, what Commissioner Blank is after when he brands us as robbers, and we smile up our sleeves. Sometimes we think it pays us to put a spoke in the commissioner's wheel in return, and we do so.

Insinuations accomplish a great deal and they do

not have to be supported by facts. Meanwhile the public listens, and, perhaps, believes.

It is a dangerous practice. All civilization is founded on faith in one's fellow man, in the inherent honesty and desire to serve of the majority. Shatter that faith and you bring about chaos. And confidence is more easily shattered in times like these than it ever has been before in our experience.

Cost of Service Plan Has in Some Instances Been Applied to Lighting Companies

Harlow C. Clark Discusses Some Aspects of the Plan and Puts the Question: Is It Not a Step Towards Stabilizing the Relations Between Utilities and Their Communities?

In the effort to secure a stable and satisfactory basis for the relations between public utilities and the communities which they serve, more and more attention is being given to what has become known as the "cost of service" plan, declared Harlow C. Clark in a paper prepared for the annual meeting of the Empire State Gas and Electric Association. While up to the present time practical application of this method of determining rates has been largely confined to electric railways, nevertheless in some instances it has been applied to lighting companies and in more instances it is being considered in connection with the regulation of their rates.

The "cost of service" plan is predicated upon the theory that utility service should be furnished to the public at its exact cost and without unusual or speculative profits to anyone. Included in this cost of service is the cost of the capital necessary for the furnishing of the service. Theoretically, this cost is the least return at which capital may be secured. Practically, the rate to be paid thereon has been specifically fixed in most instances by the term of the various franchises.

It is evident that the term "cost of service," as applied to the operation of an electric railway, represents, under a flat rate of fare, the aggregate cost of the service and not the cost to each individual, since the difference in the length of ride and the difference in the cost of operation upon various parts of the same system make it impossible to charge each passenger in accordance with the actual service rendered him. Nevertheless, the term is perhaps as comprehensive and as descriptive as can be used.

An Assurance of Return Essential

The inauguration of the "cost of service" plan necessitates on the part of the public a recognition that the private owners of a public utility are entitled to a reasonable return upon the value of their property, and that, in view of their waiving unusual profits, or the right to accrue during any period a profit higher than the average to make up for losses in any subsequent period, they should be given an *assurance* of that return; and upon the part of the owners the acceptance of return approaching that received from absolutely secured investments.

It is evident that under the strict application of this theory the cost of the required capital will decrease as the *assurance* of the return is increased. In other words, the interest paid on savings bank deposits and upon government bonds is lower than the interest paid on other investments because of the safety of these forms of investment. If, then, investors or prospective investors in public utilities can be guaranteed the stability of their investments in these enterprises, they will be content with a lower return than they would if the element of risk was increased.

This safety of investment must be protected in two ways. First, the revenues of the property must be sufficient to furnish the agreed-upon return; and, second, the integrity of the property must be preserved by the terms of the franchise; by which is meant that there shall be sufficient allowance for maintenance and repairs, depreciation, renewals and obsolescence as well as provision for proper reserve funds.

It is, of course, apparent that before a "cost of service" agreement can be entered into a determination must be made as to the value of the property upon which the return to the owners is to be allowed. In consequence, the application of the plan is very closely connected with the valuation of public utilities, and a history of the various "cost of service" agreements that have been entered into must be read in connection with the history of the valuation of these properties.

Incentive to Initiative

The "cost of service" plan for the regulation of public utilities stripped to its bones means simply that utility service shall be rendered to the public at its cost, including the cost of the necessary capital investment therein. The main objection that has been so far raised to it is that it provides no incentive to that initiative and economy which private ownership and operation under former conditions has supplied. It is argued that the owners and operators of the property, being assured of a satisfactory return under all conditions, will not devote their efforts either to economies from which they reap no particular benefit or to the development of their service which adds nothing to their coffers.

This objection has been met in some of the franchises and settlements by the addition of schemes for profit sharing, by which surplus above the agreed upon rate of return is shared with the car rider, or with the municipalities, and it may be said that although cost of service has been in effect upon the properties of the Cleveland Railway Company since the year 1910, it is still in the stage of development, and the ideal method has yet to evolve itself.

Insofar as street railways, with which from necessity this paper must very largely deal, are concerned, it was in Cleveland that the plan first saw the light. It is unnecessary to here review the bitterly contested and hard-fought war that was waged in this city between Tom L. Johnson and his school of low fare advocates and the owners of the local transportation system. The controversy was extremely costly both to the utilities and to the city. It kept the local transportation affairs of that city in a constant state of unrest for a number of years and deprived the people of Cleveland of adequate street car service, but its settlement has had and is having a very marked effect upon the future of electric railways.

The Tayler ordinance, so named from Judge Tayler, of the United States District Court, through whose efforts a settlement was finally effected, has been the basis of practically all subsequent "cost of service" plans. In Cleveland the valuation of the company's property was arrived at by a process which the owners declared to be distinctly unfair, and which wiped out at one stroke some $10,500,000 of the outstanding securities of the company. The valuation having been agreed to, the city, in effect, said to the owners of the property, "You will furnish us such service as we may direct through a public official—namely, the director of street railroads—and the fare shall be such as to provide the cost of this service and to allow you a 6 per cent return upon the valuation which has been stipulated."

Use of Reserve Fund

In the carrying out of this plan it was manifestly inadvisable that there should be constant fluctuations in the rate of fare, and it was, moreover, necessary that some machinery should be erected for absolutely determining when increases in the rate of fares should be made. This was furnished by what was known as a "Reserve" fund, which has also been described as a "Reservoir" fund. This fund not only acts as a control upon the fares to be charged upon the system, but is designed to prevent, and has prevented, frequent changes in the fares. It consisted of the sum of $500,000 furnished by the company through the sale of its securities, made a part of the capital value. From it was made up any deficit in the cost of service, including the return to the owners, and to it was added any surplus remaining after the cost of service had been taken care of. When the fund is reduced by reason of withdrawals to $250,000 or less, the fares are increased. When $750,000 has been accrued therein by reason of payments from surplus, fares are reduced.

A schedule of fares was provided covering ten different rates, starting in with a 2-cent cash fare, 1-cent transfer and 1-cent rebate, and increasing by stages until a maximum fare of 4 cents cash fare, seven tickets for 25 cents, 1 cent for transfer, no rebate, was arrived at. As the necessity occurred for either increasing or decreasing the fare, the next highest or the next lowest grade on the schedule was put into effect.

It is interesting as reflecting the increasing costs of public utility operation to note that the highest fare in the schedule has been found insufficient and that a new schedule raising the maximum has recently been adopted.

Danger to Property Value

Although the city by this agreement had said to the company that it was to receive the cost of service, including a return to the owners, and this was the theory upon which the ordinance was drawn, practically, and when placed in actual effect there was no such assurance, because the city, while assuming the right to dictate the service, also assumed the right to make allowances to the company of certain sums within which the service should be provided and to stipulate also other allowances to provide for maintenance and depreciation. It is very plainly evident that these two provisions of the ordinance were incompatible; and although under the terms of this instrument the company had a right to refuse to furnish service in excess of that possible under the operating allowance made to the company, the difficulty of ascertaining what the service asked for would cost resulted in the furnishing of service for which the company received no return. This was equally true with the provisions relating to maintenance and depreciation, which, in its efforts to retain low rates of fare, the city has always placed at too low a figure, with the result that there has been an unquestioned lessening of the value of the property of the company by reason of insufficient maintenance and insufficient allowance for depreciation, which lessening by the report of a board of arbitration has been fixed at some two million six hundred thousand dollars.

Andrew Squier's Statement

Andrew Squier, of counsel for the Cleveland Railway Company, has stated the objections that have been found by the owners of the property to the "cost of service" plan as carried out in Cleveland. Mr. Squier says that in his opinion it fails:

First—Because of its fixed and inflexible rate of return, which supplied no incentive for initiative, economy and improvement.

Second—Because it provides no safeguard for the interests of suburban communities served by the company whose right to control service and rates is equal to that of the city itself.

Third—Because the power of the city to fix maintenance and depreciation allowances imperils the integrity of the property.

Fourth—Because it is impossible to provide for the pensioning and other reward of faithful employees.

Fifth—Because it forbids the setting up or reserves for damages, insurance and other losses, and thus again threatens the investment.

These objections have resulted from the experience of a number of years' operations under the plant, and the framers of recent cost of service acts have had the opportunity to take advantage of them. There have in consequence been a number of modifications in the various plans since proposed to be put into effect.

Recent Measures

The more important of recent cost of service measures are those affecting the Boston Elevated Railway, the Bay State Street Railway, other Massachusetts electric railways, the Chicago surface lines and the Chicago elevated railroads, the Cincinnati Traction Company and the Montreal Tramways Company.

It is unnecessary to an understanding of the general situation to review in detail each of these plans. However, it is well to examine them with a view to ascertaining their treatment of what may be called the major principles of the "cost of service" theory. Without an attempt to place them in their order of importance, the provisions which would seem to be of the greatest interest are:

Those dealing with the valuation of the property.

Those dealing with the assurance of return.

Those dealing with the extent of public jurisdiction over the affairs of the company.

Those dealing with the incentive to initiative and economy.

Those dealing with the provisions for maintenance and depreciation and the establishment of reserve funds.

Those dealing with the machinery for the control of fares.

How Properties Have Been Valued

In respect to valuation, the laws enacted by the last session of the Massachusetts Legislature providing "cost of service" plans for the Boston Elevated, the Bay State and the other street railways of Massachusetts, accept as the value of the properties their outstanding securities, because for practically the entire life of the electric railway industry in Massachusetts the issuance of securities has been under the control of some duly constituted State authority. In Montreal and in Cincinnati the valuation upon which the ordinances are based is the result of negotiations between the companies and the city, and is stipulated in the ordinance. In Chicago, the valuation of the surface lines was accomplished at the time of the so-called settlement ordinances which established a partnership between the city and the company and the valuation of the elevated lines was stipulated by agreement.

As to assurance of return, in one only of these various agreements is there any other assurance of return than that afforded by a sliding scale of fares adjustable to the cost of service. The exception is in the case of the Boston Elevated Railway Company. Here the guarantee of the State has been given to the owners, and machinery has been erected for making this guarantee good. At stated intervals, in case of a deficit, the trustees operating the property may draw upon the treasury of the Commonwealth of Massachusetts for any deficit that is present in the reserve fund, and the State treasurer must in turn assess upon the communities served by the company, in proportion to the number of passengers carried, the amount of such deficit, this to be returned to the communities as the earnings of the company warrant.

The Control of Companies

In regard to jurisdiction over the companies' affairs, in the case of the Boston Elevated Railway, and of the Bay State, which latter company has, however, not yet accepted the provisions of the act, the State of Massachusetts has embarked on the policy of private ownership but of public operation. Although this decision does not affect in any way the carrying out of the "cost of service" plan, it is an experiment that will undoubtedly be watched with the utmost interest. Since it is the State, and not the municipality, which has undertaken the management, the objections raised by Mr. Squier, as to the operation of the Cleveland plan that the rights of the surrounding communities were disregarded, has been overcome.

The City of Cleveland works for low fares in Cleveland. It interests itself very little in the affairs of the suburban towns, and as a matter of fact higher fares in these communities work to its advantage, since there has been no segregation of either expenses or receipts. By State control, as opposed to municipal control, this objection is obviated.

For the Boston Elevated Railway Company nine trustees have been appointed by the Governor of the State. They are responsible to the State and not to the City of Boston, and they act in the interest of the many surrounding communities which the Boston Elevated serves, as well as in that of Boston itself. The trustees have been removed from the jurisdiction of the State Public Utility Commission in practically all respects, and are an independent body whose responsibility for the successful operation of the property is backed up by the necessary authority, thus removing that anomalous condition which has for so long existed with respect to privately owned and operated utilities whose responsibility has been enhanced but whose authority has constantly been diminished through the operation of regulatory laws.

For the other Massachusetts companies there has been no provision for public management, but their supervision and regulation rests not with the communities in which they operate but with the State through the Public Service Commission.

Cincinnati, like Cleveland, has provided for itself a system of local control, the city, acting through a Director of Street Railways, and maintaining jurisdiction in all but a few details which are left to the Public Utilities Commission of the State.

Montreal likewise has erected a Rapid Transit Commission controlling and supervising the affairs of the Montreal Tramways Company, but the right of appeal from its decisions, both for the company, the city, and the surrounding committees lies with the utilities commission of the Province of Quebec. No attempt at direct public operation has here been made.

The Chicago Plan

One of the principal objects of the Chicago ordinance was the consolidation of the local traction systems, and in order to secure this, a new company to take over the properties of both the surface and elevated lines has been authorized. This company is "not for pecuniary profit." It is administered by a board of nine directors, whose successors will be nominated by the city and who have the power to fill vacancies that may occur during the term of office of the directors. These directors are subject to the jurisdiction of the city and to such supervision from the public utilities commission of the State as may be decided upon in legislation yet to be enacted.

If there has been improvement in the service and economy in the operation of public utilities since the days of the horse and the first electric lamp, it has been due to the constant effort on the part of the operators to extend their services and to cut down the operating expenses. It is obvious that their reward lay in an increased return, or the maintenance, under rising costs, of the same return. Public utility owners have risked and have lost many millions of dollars in experiments with apparatus and methods in an endeavor to increase business and lower costs and the benefits of these costly departures from accepted methods have been largely reaped by the public.

It is, therefore, a pertinent question whether with a

return fixed and not to be added to by any efforts on the part of the public utility operators, the improvements and developments that have hitherto marked the onward path of the utilities will be continued. In other industries, initiative and enterprise are well paid for. Is it possible, then, to secure them in the public utility field without providing a direct reward therefor? And is not such a reward a legitimate and very necessary element in determining "the best possible service at the lowest possible cost?"

Rewards For Good Management

Among the seven cost of service agreements which we are considering diverse methods are provided for supplying this need where it is recognized. In the case of the Boston Elevated Railway and of the Bay State Company, the public has undertaken the management of the properties, and the initiative of public authority is substituted for that of private owners. Chicago is, if the ordinance adopted by its City Council becomes effective, to try practically the same experiment, although for the first ten years of the agreement the existing companies are to be represented upon its Board of Trustees. In the Massachusetts general cost of service law, the Cleveland idea of a fixed return not to be varied, by reason of any economies, or enterprise on the part of the owners is followed, although provision is made for possible increases in the cost of new money.

Cincinnati and Montreal have both, however, given distinct recognition to the principle that careful and enterprising management should be rewarded. The provisions of the Cincinnati ordinance combine with service at cost a modification of the Boston sliding scale plan first adopted for a lighting company. When the fare is more than six cents, all surplus receipts, i. e., the receipts remaining after the cost of service is paid, go into the reserve fund and are used for the reduction of fares; when the fare is six cents, twenty per cent of the surplus goes to the company as an additional return, and eighty per cent. to the fund; when the fare is five cents or less, the company receives forty-five and the fund fifty-five per cent. Here, then, is provided a direct incentive to the company to keep operating expenses at the lowest possible point, the quality of service being safeguarded by the control which the city exercises over it through its commissioner of street railroads.

Maintenance and Depreciation

In Montreal, two provisions for rewarding good management are provided. The first is through an allowance of an operating profit of one-eighth of one per cent., which the company receives if it keeps its operating expenditures for the year within the amount fixed by the Montreal Tramways Commission, the percentage being on the total amount of operating expenses. The second is through a three-way division of the surplus receipts, defined, as in Cincinnati, as the amount of revenue remaining after the payment of cost of service, by which the reserve fund receives 50 per cent., the city 30 per cent. and the company 20 per cent.

The question of maintenance and depreciation in connection with the cost of service plan is bound to present an exceedingly difficult aspect. Were it possible, first, to draw an absolutely satisfactory line between the two items, and second to agree on fixed rates of depreciation, including obsolescence, the solution of the question would be easy. It is not, and allowance for these items is to a large extent a matter of judgment.

In Cleveland by the terms of the Tayler ordinance the allowance for maintenance, depreciation and renewals (there having been no attempt to differentiate between these items) was fixed at four cents a car mile for the months from December to May, inclusive; at six cents for the months from June to October, inclusive; and at five cents for the month of November. By 1913, three years after the ordinance took effect, there was due the company from the reserve fund for expenditures not included in the allowance, $323,597, and for equipment retired from service, $705,347. These amounts were fixed by the board of arbitration and, according to the statement of Mr. Squier, have increased so that they now amount to more than $2,600,000.

In the Massachusetts laws the allowance for maintenance and depreciation is left to the judgment of the State appointed Trustees in the case of the Boston Elevated, and to the Trustees, or the Public Service Commission, should it fix a definite allowance, in the case of the Bay State. In the general Cost of Service Law, the amount is fixed by the Public Service Commission and the provision is added that in the case of abandoned property the amount must be amortized through earnings over a space of ten years.

In the Montreal franchise, the allowance for maintenance and renewals is fixed by the Transit Commission at so much per revenue car mile. Maintenance is paid for from this fund, as well as renewals. When an article is replaced, the full reproduction value is taken from the fund and the additional cost, if any, is charged to capital account. If the cost of replacement is less than reproduction value, the difference is credited to the fund, as are also proceeds from the sale of obsolescent property. The law provides that the fund must at all times be maintained as near as possible at $500,000.

In Cincinnati a depreciation fund is provided by crediting to it for each of the first five years under the agreement the amount which it has been the practice of the company in the past to set aside for depreciation. Before the end of the first five years, the Ohio Public Utilities Commission is to prescribe the methods of providing for depreciation and to set the amount which shall be allowed for that purpose.

Provisions in Chicago Law

In Chicago, a depreciation and renewals fund has been created. Into this before the fifth day of each month is to be paid eight per cent. of the gross receipts of the previous months. Out of it is to be paid the cost of renewals, the remainder to be set aside for depreciation. Renewals are defined as "replacement of any principal part of the system, or its equipment or appurtenances (including pavements), or subways." The trustees are empowered to either increase or decrease the percentage of gross receipts paid into the fund and are instructed from time to time to classify expenditures into items of maintenance and repairs, and renewals. In addition a separate fund amounting

to six per cent. of the gross receipts of the Company shall be spent each year for maintenance and repairs, or if they are not so spent in any particular year, shall be accumulated in a fund and later expended.

The wide difference in the allowances for maintenance and depreciation between the Cleveland ordinance, with its maximum of 6 per cent, and the Chicago ordinance, with its provisions for approximately 14 per cent, which in the judgment of the trustees may be increased, should be noted.

Control of Service

It is, perhaps, in its provision for control of service that the cost of service plan is most effective. Under a fixed rate of fare there is an inevitable tendency on the part of the public to constantly demand improved, increased and, in many cases, unprofitable service. Whether or not such service can be furnished for the rates imposed is a matter of concern to the company and not to the public. In consequence, as regards electric railways at least, some of the most serious differences between the public and the utilities have been over service rather than over rates.

The main functions of regulatory commission have in the past been those concerned with service, and the greatest complaint that the utilities have had against them is their disposition to disregard cost in their orders as to the service to be furnished. They have been given by the law wide latitude in the control of service which has been unaccompanied by inadequate responsibility for the procurement of revenue with which to carry out their orders.

Theoretically, under the cost of service plan this conflict is entirely removed. The public can demand such service as it wants, and it is the duty of the utility to furnish it; and since theoretically there is an assurance of adequate revenue through the flexible fare provision, all reason for opposition from the companies is eliminated.

It would be interesting, if time permitted, to follow out the practical working of this theory as it has developed in the case of the Cleveland Railway Company. Several exhaustive studies have been made to ascertain whether, under a plan that allows it to determine its own service, the Cleveland public is receiving something superior to that which other cities in which no such privilege exists receive. Those who desire to pursue the subject further are referred to the chapters on the Cleveland situation which appear in F. W. Doolittle's report to the committee on cost of passenger transportation service of the American Electric Railway Association. The situation may be briefly summarized in Mr. Doolittle's own words: "Standards of service are much below those usually prescribed by regulating bodies."

This is because the rate of fare is and always has been a political issue in the city of Cleveland. The control of the service is in the hands of the political party in power. The rate of fare is before the people in each municipal election, and it has been the constant endeavor of the various parties to keep it as low as possible. In consequence, operating economies not permitted in other cities are welcomed in Cleveland and service is to a large extent sacrificed to maintain low fare levels. Moreover, it is unquestionably true that a part of the municipal burdens which in other cities are placed upon the utility are, in Cleveland, assumed by the municipality.

In Cleveland the control of the service is directly in the hands of the city council, acting through the street railway commissioner. Cincinnati has a similar provision. In Montreal it is controlled by the transit commission. In Chicago, and in the case of the Boston Elevated and the Bay State in Massachusetts, it is in the hands of the trustees. Under the provisions of the Massachusetts general cost of service bill it is in the control of the public service commission.

Extension of Lines

It is evident that extension of lines is an important part of service, and for this reason the provisions of the various acts covering the control of such extensions are of particular interest. In the Tayler ordinance the company alone has the right to propose extensions, or major betterments and improvements, the city retaining the veto power and supervision over the expenditures for such purpose. It was evidently the intention here to restrict the capital value, and the necessity of providing increased facilities as the city grew and developed was left to the judgment of the company.

In later acts, however, the determination as to the building of extensions has been placed with the public authorities, although all of the agreements contain safeguards which prevent the building of extensions that would impose unwarrantable burdens upon the company during the later part of the period of operation under the cost of service plan. In the Massachusetts general act the right of appeal to the courts is vested in the company, when it believes that extensions ordered by the commission are against its interests.

Rate Control Machinery

The machinery for the control of rates is in all cases practically the same, although there are some modifications as to details. A reserve fund is established with money furnished by the company. The condition of this fund is the gauge of the necessity of an increase or decrease in fares. "Cost of service" is taken out of the gross receipts. If there be a deficiency, it is paid from the reserve fund. If there be a surplus, it is added to the reserve fund.

The items which shall go to make up cost of service are defined in each of the agreements, as well as the order in which they shall be paid. They are in general as follows:

Operating expenditures.
Maintenance and renewals.
Taxes and other imposts.
Depreciation and obsolescence.
Interest on bonded debt
Return to capital.

Rate of Return

The provisions as to return upon capital vary with the various acts. In Cleveland it is 6 per cent, in Chicago 8 per cent, in Montreal 6 per cent, plus the operating profit and a percentage of the "divisible

surplus," in addition to an allowance for the cost of floating new capital; for the Boston Elevated it is 5 per cent for the first two years, 5½ per cent for the next two years and 6 per cent thereafter; in Cincinnati the rate of return depends upon the fare in force during the year; for the Bay State it is the fixed return upon preferred stock and 6 per cent upon common stock; in the Massachusetts general act it is 6 per cent, or *such other rate as may be necessary to attract new capital.*

When it is considered that in order to raise the $3,000,000 required for the rehabilitation of the Boston Elevated Railway, it was necessary to permit a return of 7 per cent upon these State guaranteed securities, this provision of the Massachusetts general law, in view of the increasing cost of money, seems particularly desirable, if new capital is to be attracted to the utility industry. In all of the acts with the exception of Chicago's, where the amount of increase or decrease is left to the judgment of the trustees, a scale of fares is stipulated. As the necessity for an increase or decrease arises, change is made from one to the other of these rates. In each case the change is made, if it be made, at certain fixed periods during the year, according to the condition of the reserve fund at that time.

State Subsidies

Although not necessarily a part of the cost of service plan, the action of the State of Massachusetts in providing machinery for subsidizing its street railways may properly be mentioned in this paper. Specifically, in the case of the Bay State Street Railway Company, and by a general statute to cover other electric railways, the Commonwealth has made it possible for communities, faced with an increase in street or interurban railway rates, which they believe will interfere with their business prosperity, to assume, through the tax budgets, a part of the cost of operation and so to retain a lower fare than the actual cost of the service would warrant, while at the same time assuring to the owners of the property a fair return. It is quite possible that this authority may be exercised in the case of the Boston Elevated Railway Company, where a seven-cent fare has been found insufficient and where the public trustees are confronted with the alternative of either a further increase or a demand upon the State and hence to the communities for a subsidy.

This provision was possible in Massachusetts, because the Constitution of that State contains no restrictions upon the expenditure of public money for other than strictly public purposes. I am advised that in New York and in many other States such a law would be unconstitutional.

The application of the cost of service principle to the business of electric and gas companies offers interesting possibilities. It would seem, because of a less complex system of charges, that the electric railways present fewer difficulties in the way of its adoption. I have been able to discover, however, two instances where it has been adopted by gas companies. In neither of these instances was the plan enforced by reason of State or municipal action, both being the voluntary act of the company itself.

Applied to Gas Companies

I am referring to the Norwood Gas Company and the Gardner Gas, Fuel & Light Company, both Massachusetts corporations. The system used may best be explained by a direct quotation from the circular sent by the Gardner company to its patrons. The company said:

"Recognizing the responsibility to its customers to continue to furnish them gas, and having exhausted its surplus by furnishing gas below cost during the past ten months, it must now ask that its customers pay what it costs to carry on the business of making and supplying gas from now on.

"Each month we will file with the board of selectmen and Business Men's Association a certified statement as to the exact cost of rendering this service to our customers. At our offices papers showing these costs will be open to examination by anyone who may desire to see them and we will stand ready at all times to give whatever additional data may be desired.

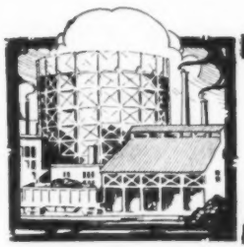
"The cost of doing business consists of costs we can all understand, as they are merely the cost of coal, oil, materials, pay-rolls, insurance, taxes, management and auditing, interest on the cost of the property and depreciation.

"Customers will be advised on or about June 1 of the cost of gas to Sept. 1, based on the service at cost plan for the ensuing three months, and on or about Sept. 1 and each three months thereafter will be again advised of the cost for the next three months. . . .

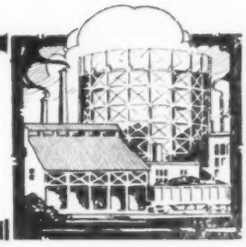
"Costs after the war may decrease as rapidly as they are now increasing, therefore this company feels that it is only fair that this arrangement shall continue for the same period of time after the war as it is in effect during the war, to give its customers the benefit of any reduction in costs that may come after the war."

Conclusion

I have endeavored in this paper to call attention to some of the more prominent features of the service at cost plan. Whether it is the answer to the problems that confront the utility world at the present time is not an easy question to determine. In but one city has it been for any length of time in operation, and there objections have developed. It is certainly true, however, that it is being regarded with increasing favor by certain sections of the public and by not a few operators of public utilities. It is not at all improbable that conditions brought about by the war will force Federal control of electric railways and perhaps of other utilities. It is, however, inconceivable that such control will continue after the war is ended. The time seems ripe, therefore, for the closest study by utiltiy men of means and methods of readjusting their relations with the public in order that the present state of uncertainty, distrust and chaos may give way to a better understanding and a more satisfactory basis for carrying on an industry so essential to the public welfare. The cost of service plan may furnish a basis for this.



NEWS OF THE GAS INDUSTRY



U. G. I. Revives Office of General Manager

The United Gas Improvement Company has revived the office of general manager which was abandoned when Samuel T. Bodine became president. Lewis Lillie, vice-president, has been made general manager as well as vice-president.

Raise at Clinton, Mass.

Because of a continued advance in the cost of labor and material to the Clinton Gas Light Company, serving Clinton, Mass., Supt. Robert E. Freel stated that the company has found it necessary to advance the price of gas ten cents per thousand cu. ft., effective Nov. 1, on all bills rendered Dec. 1.

The Clinton Gas Light Company has for the past few years been charging $1.40 per thousand cu. ft. Notice has also been issued to electric power customers of an increase of one-half cent per kilowatt, making the price six cents per kilowatt.

Plan to Check Up All Wholesale Meters for Natural Gas in Kansas and Missouri

That there has been a "terrible wastage of natural gas in cities in Missouri and Kansas" is the statement contained in a news dispatch from Washington received at St. Louis. The dispatch adds that the Fuel Administration has joined with the Bureau of Standards in a campaign to check at once all wholesale gas meters in the natural gas districts of these two States. The Fuel Administration, it is said, estimates the value of the gas wasted during the last year as $9,000,000.

After saying an investigation had been started to ascertain the source of the waste, the dispatch adds:

"The wholesale companies are advising the investigators it is the distributers who are at fault, and the distributers are placing the blame on the wholesalers. The investigations disclosed that out of a total of 9,557,143,000 cu. ft. of gas delivered for the year ending last August, the distributers only delivered and sold to the consumers 5,679,256,000 cu. ft. This shows a loss of 3,977,887,000 cu. ft. of gas.

"Poor construction of pipe lines and failure of consumers to apply methods of conservation are blamed for part of this loss."

Because of the declaration of a legal holiday following the consummation of an armistice Nov. 11, the St. Louis office of the United States Fuel Administration could not be reached for a statement on this subject.

Bids for Indianapolis Street Lights Expected

Bids on column gas lights for the Indianapolis city streets are to be received at once by the board of public works of that city. The city proposes to pay for the gas used in the lamps, while the contractor will take care of the lights and keep them in condition. The city now handles all details of its own gas lighting.

C. L. Holman Finds Many "Ifs" Intervening in Endeavoring to Foretell Effects of War's End on Gas and Electric Companies

The Rate Question by No Means Relegated to Background—Necessity for Relief in This Manner Continues and Probably Will Continue for Considerable Time to Come

(By Telegraph, Nov. 14, 1918)

In an interview with a staff representative of the American Gas Engineering Journal C. L. Holman, president of the Laclede Gas Company of St. Louis and vice-president of the American Gas Association, expressed himself as follows in regard to the effect of the war's end on the gas and electric companies:

It is perhaps rather early after the close of hostilities to forecast the immediate effect that the termination of the war will have upon the industries of this country. Many important questions such as the stabilizing of freight rates, car shortage, labor supply, wages, coal and oil production, prices of materials and cost of money, will have to be considered and adjusted before a clear vision may be had of the business situation. If the signing of the armistice and the anticipation of the peace arrangements should result in the release of a large number of men now engaged in military service to return to industrial occupations, a solution of the labor question might be determined without much delay, but if, on the other hand, the forces now in France should be retained there for a considerable period the difficulty of securing labor at a reasonable rate of wages would prevent, for a time, the return of normal business conditions. It is no doubt true that the cancellation of unfilled contracts and the discontinuance of the manufacture of munitions would result in some relief in the labor market, but probably this question will not be settled until after the return of the men now serving abroad.

The utilities engaged in supplying gas and electricity may in some instances be indirectly concerned in

activities connected with the war by furnishing firms engaged in munition work with power and light, but the larger volume of the business of such industries is in supplying domestic users and ordinary business enterprises. The return of peace will probably have the effect of increasing domestic consumption of gas over the present demands and will to some extent overcome the decrease in the volume of industrial business resulting from cancellation of war contracts.

The decrease in the size of families, due to members being abroad, and the practice of domestic economies, because of the war, have had a considerable effect on the consumption of gas used for household purposes, as well as in the use of gas in hotels and restaurants. The decrease in the price of raw materials used in the manufacture of gas and electricity will probably not be very rapid, mainly depending upon the demands of foreign nations upon the manufacturers of this country.

A full appreciation of the part of State commissions and municipal authorities of the trials and tribulations which public utilities have endured during the past year would undoubtedly result in more liberal treatment in the matter of granting increased rates to compensate for losses sustained during the unavoidable conditions which have recently prevailed. Unless some relief in the matter of better rates is given, there is great danger of impairment of the service to the public because of the difficulty that will be experienced in re-financing and obtaining money for extensions and betterments.

We may, however, reasonably conclude that the return to normal conditions cannot but result ultimately in benefit to the gas and electrical industries throughout the country.

Potash from Blast Furnace Gas

Rapid strides are being made by engineers in this country in recovering potash. In the foreground of this new enterprise stands America's cement plants where many many tons of potash are being extracted from the kiln gases. How long the cement industry will continue to be the chief producer of by-product potash is a matter of conjecture. Already blast furnaces are looming up as a strong competitor and before long may become one of our important sources of potash reclamation. A 200-ton blast furnace smelts as much potash-bearing materials in twenty-four hours as a 3,000-barrel cement plant in the same length of time.

It is said England is now recovering nearly as much potash from blast-furnace gas as was imported from Germany before the war and that before long will not have to depend on outside sources for her supply. The same might be said of America if our blast furnaces would consider the importance of potash recovery. Blast-furnace gas has to be cleaned of dust-bearing materials if it is to be burned efficiently. Why not make the proceeds derived from the sale of potash pay for the purification of the gas?

Many blast-furnace superintendents have lowered their operating costs considerably in the past few years. The recovery of potash opens another avenue for cost reduction not in mills per ton of iron but in cents. When the process of sintering flue dust was advocated, few furnace managers realized that such a large saving would be effected. Yet this is just what happened. Hot-blast stoves, automatic charging devices, gas washers, slag crushers—all these also brought about a decrease in operating costs. A potash by-product will do the same. It remains to be seen whether or not American blast furnacemen will take advantage of the opportunity offered by way of recovery plants and thereby break another of Germany's economic weapons which she intends to wield after the war.

Improvement in Situation Deters Fuel Administrator from Recommending General Lowering of Heating Standard

United States Fuel Administrator Harry A. Garfield has announced that, under existing conditions, he did not feel warranted in recommending to local boards the abandonment of existing gas standards as a fuel-saving measure.

A special committee was appointed in connection with the Bureau of Standards to investigate the heat value of artificial gas, but since the creation of this committee, Mr. Garfield pointed out, the fuel situation has materially changed.

Public service corporations are asked to consider whether a reduction of B.t.u. standards by companies under their jurisdiction will actually save oil, with the recommendation that if a reduction in quality is ordered there should be simultaneously a corresponding reduction in the price of gas. The statement says:

"In July last the United States Fuel Administrator appointed a special committee in conjunction with the Bureau of Standards to investigate the heat value of artificial gas with a view to recommending what change, if any, in the B.t.u. standard would save coal or oil. Since the creation of this committee the fuel situation has materially changed. The production of bituminous coal has increased under the stimulus of the Administration to unheard of figures and the situation is not as critical as last summer. Yet it is probable that under zoning orders of the Fuel Administration, some gas plants throughout the country will not be able to receive their customary rate of coal and this may necessitate a temporary reduction in gas standard.

"At the cessation of hostilities the demand for oil and coal will be transferred to other channels and the pressing demand for immediate deliveries will be reduced to such an extent that the Fuel Administration does not feel warranted in asking local boards to abandon existing standards.

"While it is not within the province of the Fuel Administration to request thrift in general, Mr. Garfield desires to call attention to the fact that we are using up our oil deposits perilously fast and therefore Public Service Commissions should consider whether or not a reduction of B.t.u. standard by the companies under their jurisdiction will actually save oil. In the interest of the public, however, wherever a reduction in quality is ordered or approved there should be simultaneously made a corresponding reduction in the price of gas."

Increase at Burlington, Vt.

On account of the great increase in the cost of coal, oil and other material entering into the manufacture of gas, as well as the increase in the cost of labor, the Burlington (Vt.) Light & Power Company will file with the public service commission an advance of 20 cents per M cu. ft. over the present price. This

advance is seven cents per thousand cubic feet less than the increased cost of manufacturing.

The increase in rates will become effective after the November reading of meters.

Central Indiana Company Must Continue Supply Until Shortage Becomes an Actuality

City Attorney Bitterly Rebuked for Aspersions on Public Service Commission—City Officials Express Themselves as Satisfied that Their Interests Have Been Safeguarded

The public service commission of Indiana at a hearing held Nov. 10 set the formal hearing of the complaint in which the Central Indiana Gas Company alleges inability to continue the supply of natural gas to all its customers in central Indiana towns and cities, and asks authority to increase prices on artificial gas, for Dec. 4.

In the meantime, according to an announcement from Commissioner Paul P. Haynes; the commission will enter a temporary order that the company shall supply natural gas to its consumers until danger of a real shortage looms up. Then the company will be required to shut off its industrial consumers first. The cities involved in the controversy include Muncie, Marion, Alexandria, Anderson, Elwood, Fairmount, Hartford City, Gas City, Tipton, Noblesville, and other towns and cities.

At the preliminary hearing of the controversy John McPhee, city attorney of Muncie, who has taken an active part in the organization of a special investigating committee to go to the West Virginia gas fields to determine at first hand whether the Indiana supply will run low, came in for bitter criticism at the hands of the commissioners for alleged remarks he had made concerning the commission's attitude on rate increases in wartime to public utilities.

When McPhee appeared before the commission with representatives of other "gas belt" cities in the matter of artificial gas rates for those cities he faced an angry body of men. He was confronted with his statements made before the Muncie city council that the public service commission was "making a specialty of increasing public utility rates" in the State, and that no matter what the case brought before it by the city of Muncie might be, the situation is hopeless and that appeals would have to be taken to the courts from decisions of this commission. He was particularly assailed by Commissioner Charles A. Edwards, Democratic member of the commission, who characterized his charges as "infamous as hell," and said that he (Edwards), as a minority member of the commission, had been making a fight for months for higher return for public utilities. He said that he did not agree entirely with the war period policy of the commission which limits the rates to the corporation to 4, 5 and 6 per cent in a time when money that they have to command is costing in excess of 6 or 7 per cent. He indicated that he had been out of line with the policy of the commission to keep rates during this war period down to the low level to which they have been kept. He called attention to the fact that Mr. McPhee had, on one occasion at least, carried to the courts a decision of the commission and had lost in that appeal, indicating that the decision of the commission was right.

Commissioner McCardle was especially vigorous in demanding of McPhee an explanation of his statements, and McPhee made a faltering reply, indicating that he was in Indianapolis ready to handle the gas matter and that he might have been mistaken in some of the statements he had made and that he was not responsible for the expressions of Muncie newspapers that are political in character.

Commissioners Haynes and Lewis pointed out that the commission had followed the appeals made by President Wilson and Secretary McAdoo to keep the utilities in operating condition during the war period, and that in Indiana every case had been handled on its own merits. It was pointed out that without any hearing Secretary McAdoo, as director-general of the railroads, under authority of President Wilson, increased freight rates 25 to 2000 per cent; passenger rates in excess of 50 per cent; express rates, 10 to 25 per cent; postal rates, 50 to 100 per cent; and also pointed out that cities represented in the conference in which McPhee was arraigned—notably Anderson and Tipton—had been before this commission asking increases in electric light and power rates; that the Mellett administration at Anderson had been given a half-cent increase in all electric rates; that the city of Tipton is now petitioning for a 25 per cent increase in electric rates.

The commission showed that but for its attitude of requiring public utilities to carry their part of the burden of the war period increases in rates would have been general. This is indicated by the petition filed a year ago by the Indiana Electric Light Association for a 30 per cent increase in all electric rates in the State, the petition of the Indiana Gas Association for a 25 per cent increase in gas rates and a 10 per cent reduction in heating standards, and concerted efforts on the part of telephone interests for blanket increases.

Mr. McPhee had nothing to say. The matter was dropped for the time being by the chairman of the commission serving notice that he wanted "men who stooped to the level of blackguarding" to stay out of his office.

All of the "gas belt" cities were represented in the hearing to-day, and at the close of the session the city attorneys and mayors of other towns and cities said they, their citizens and utilities had been treated fairly, they thought, during the strenuous war period that has disturbed all operating conditions.

Rates Raised at Middletown, Ind.

The Middletown Gas Company of Middletown, Ind., was granted an increase of 25 cents a 1,000 cu. ft. for natural gas, the new rates being $1.25 for the first 2,000 ft. and 75 cents for all over that amount.

Amsterdam Rate Case Before Public Service Commission

The public service commission recently gave a hearing on the proposed increased rates for gas in Amsterdam, N. Y., the application being made by the Chuctawanda Gas Company.

Personal Notes

MORSE DELL-PLAIN, formerly sales manager for the Syracuse (N. Y.) Lighting Company, has become vice-president of the Northern Indiana Gas & Electric Company, with headquarters at Hammond.

FRANK B. STEELE, vice-president of the Charles M. Kelso Company and at one time connected with the Dayton (Ohio) Power & Light Company, has accepted the associate managership of the Utica Gas & Electric Company, Utica, N. Y.

JOHN R. ELLIS has been appointed manager of the Temple (Texas) Gas Light Company. He will also serve as superintendent of the works at Corpus Christi and Waxahachi, owned by the same corporation.

At Claremont, N. H., Nov. 7, FRANK PRESCOTT MAYNARD, president of the People's National Bank and of the Claremont Gas Light Company, died. He was 68 years old and for thirty years was active in business enterprises at Claremont. Before that he was engaged in the shoe manufacturing business in Brockton and Nashua. He was born in Fairfield, Me.

FRANK F. RUSSELL has been appointed assistant superintendent of the gas plant of the Newburyport (Mass.) Gas & Electric Company, succeeding the late Nicholas Johnson.

THOMAS M. BRADBURY, secretary of the Missouri Public Service Commission, died suddenly Nov. 12.

Construction Notes

Contemplate Large Manufactured Gas Plant at Sandusky

Formal notice has been served that the supply of natural gas of the Sandusky (Ohio) Gas & Electric Company must be discontinued shortly, due to the failure in gas supply at the wells. For several years part supply only has been available during the cold weather periods, so that the failure has not been entirely unexpected. The company is preparing plans to construct a large artificial gas plant which will assure a reliable and continuous supply of gas at all times. The actual commencement of the erection of such a plant is awaiting action by the authorities at Sandusky on an artificial gas rate. It is expected this will be taken soon, so that the new plant will be ready to serve when the natural gas supply is discontinued.

Work to Be Suspended on Laclede Gas Company Shell Plants

The Ordnance Bureau at St. Louis has stated that work probably will be suspended at the two shell plants under construction for the Laclede Gas Light Company. One plant is 15 per cent completed and the other 90 per cent. The estimated cost was $8,000,000. It is thought an effort will be made to convert the plants for private purposes.

Alterations Being Made at New Britain

The New Britain, (Conn.) Gas Light Company is having alterations made at its plant. The B. H. Hibbard Company has the contract. The estimated cost of the changes is $1,000.

Preliminary Plans for War Emergency and Reconstruction Conference

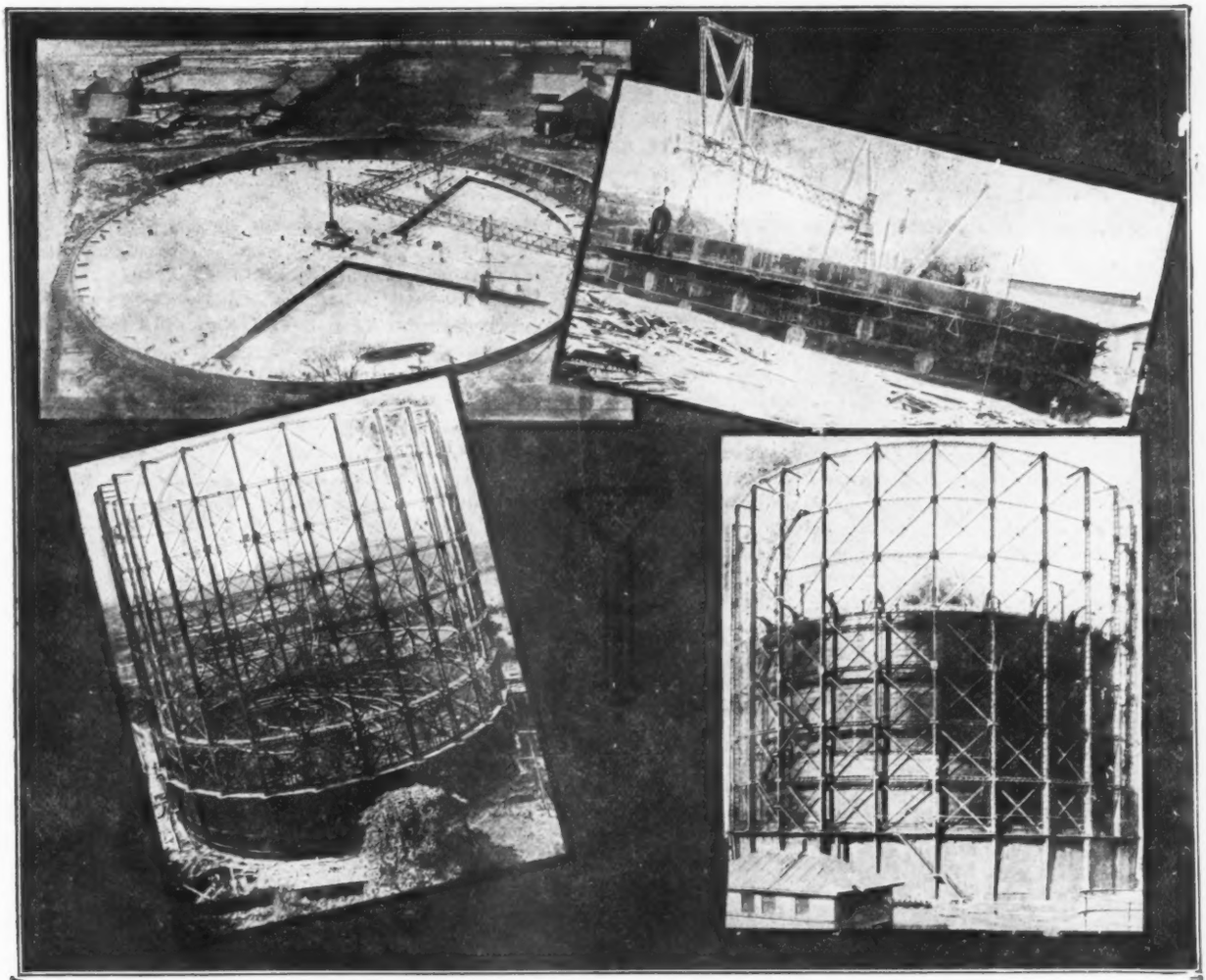
Preliminary plans for the War Emergency and Reconstruction Conference of War Service Committees to be held at Atlantic City, Dec. 4, 5 and 6, are announced by the Chamber of Commerce of the United States.

Reconstruction will be given a prominent place on the program, as it is recognized this subject must be taken up by business men to the end that there may be placed at the command of the government all available sources of information. The work of reconstruction suggests the creation of a federation of all war service business. War industries and non-war industries are concerned equally in the determination of reconstruction problems. All European countries already are under way with reconstruction plans.

The Atlantic City conference, a call for which was sent out last week by the War Service Executive Committee of the Chamber of Commerce of the United States, will include four general sessions and numerous group and committee meetings. Into the final session will be brought for final action all the proceedings of the meetings.

There will be four general sessions participated in by all the delegates. On Dec. 4 there will be both morning and afternoon sessions and on the 5th and 6th morning sessions. The Chamber is engaged now in obtaining the best speakers available to discuss among others the following suggestions: reconstruction, industrial relations, raw materials and their control, price control, economic legislation affecting combinations, export and import operations, finance, etc.

The conference will be divided into groups at three sessions, the first to be held on the evening of Dec. 4, the second on the afternoon of Dec. 5, and the third on the evening of the same day. On the evening of Dec. 4 each war service committee will meet its chairman to consider the problems of reconstruction as they affect that particular industry as well as to take up other problems which the war has demonstrated are vital to industry. On the afternoon of Dec. 5 the war service committees will meet in groups which are related as to their use of basic materials and as to their distribution problems, etc. With these groups will meet the commodity or section chiefs of the War Industries Board. Related groups will form themselves into ten major groups on the evening of Dec. 5 to take up the question of raw materials, price control and subjects arising from related group meetings. After the general meetings of the committees of the related groups and of the major groups it is hoped there will be presented definite recommendations covering the reconstruction period, with the possibility of creating an executive committee empowered to gather data and to function with industries to meet the many problems that the nation's industries will be called upon to solve with the end of the war.

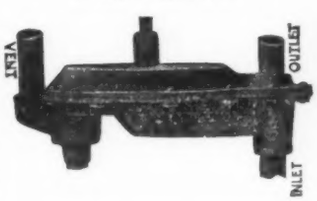


RITER-CONLEY COMPANY

STEEL CONSTRUCTION

PITTSBURGH

HIGH PRESSURE



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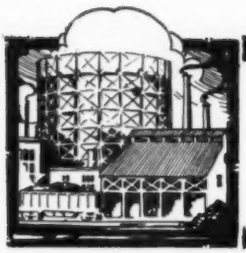
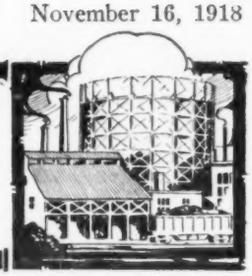


With The Equipment & Appliance Manufacturers



Conducted by Business Department of American Gas Engineering Journal

Use of Steam Instead of Air Improves Economy of Doherty Economizer

The best coal gas bench is obviously the one which has the longest life in service, carbonizes the greatest amount of coal per 24 hours and gives the maximum yield of gas with the least consumption of bench fuel.

The superiority of the sectional silica retorts supported in the bench with the silica block settings has been unquestionably demonstrated to be superior to any materials that are commercially available for gas bench work.

The producer or furnace in the Doherty Economizer Bench is claimed to operate absolutely free from clinkers.

The prevention of clinkers depends upon maintaining the temperature in the fuel bed below the fluxing temperature of the ash.

In the Doherty Economizer Bench the temperature in the fuel bed is kept below the clinker-forming point by the introduction beneath the grate bars and forcing up through the fuel bed of a part of the waste products of combustion withdrawn after they have given up their useful heat to the retorts. In the case of combustion in a gas bench the chemical combination of the carbon monoxide, or CO, which rises from the producer or furnace, with the oxygen or O, in the secondary air results in the formation of carbon dioxide or CO_2; this chemical combination resulting in the production of intense heat in the combustion chamber around the retorts.

As is well known, oxygen when it comes in contact with incandescent carbon combines with the same chemical reaction mentioned above, resulting in the formation of CO_2. Each molecule of this CO_2 contains one atom of carbon and two atoms of oxygen, omitting any consideration of the nitrogen element in the products of combustion, which acts merely as a diluent. The waste products of combustion are chiefly CO_2, which, with the Doherty Bench Fuel Economizer before being introduced beneath the grates is automatically mixed with the proper amount of O or primary air required to support combustion in the furnace.

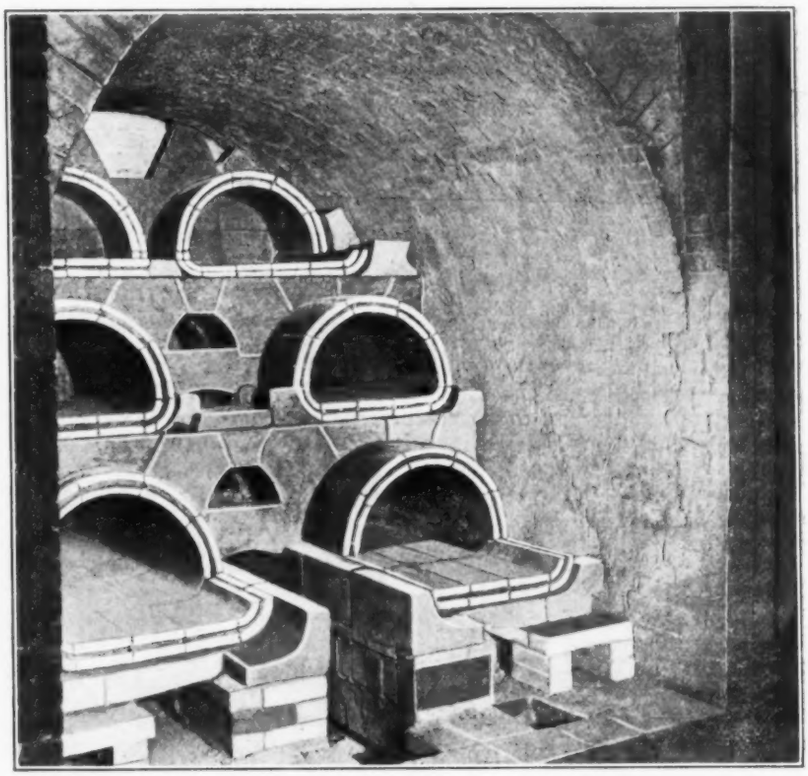
When passing up through the fuel bed the CO_2 molecules are robbed of one atom of O which combines with the hot carbon to form CO, thus forming twice as much CO by volume as we had CO_2 originally. The dissociation of CO_2 into CO and O is an endothermic reaction, or heat absorbing reaction, and keeps the fuel bed below the clinker forming point.

The results of the application of this process are a very great saving of bench fuel, uniform heat conditions, increased capacity of gas per 24 hours, and extending the life of the gas bench.

This process is extremely simple, and with the proper depth of fuel bed it is automatic in operation.

When the CO_2 return process was first applied to coal gas benches a positive pressure air blower was used to supply the primary air and induce the CO_2 gases under the grate bars, but on account of the cost of the blower, which was an added expense to the first cost of an installation and required attention to operate, the air blowers have been dispensed with and a very efficient injector has been developed which operates with steam.

The Doherty Economizer is manufactured by the Improved Equipment Company, 60 Wall Street, New York.



VIEW SHOWING MANNER OF LAYING UP SECTIONAL RETORTS—BENCH OF 6'S